

IDENTIFICATION

PRODUCT CODE: MA1NDEC-8E-01HA-D-(D)
PRODUCT NAME: PDP8-E MEMORY EXTENSION
AND TIME SHARE CONTROL TEST
DATE CREATED: NOVEMBER 1, 1970
MAINTAINER: DIAGNOSTIC PROGRAMMING GROUP
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1. ABSTRACT

THIS PROGRAM TESTS THE MEMORY EXTENSION AND TIME SHARE CONTROL LOGIC FOR PROPER OPERATION. THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH MEMORY EXTENSION AND TIME SHARE CONTROL.

ERRORS ENCOUNTERED DURING RUNNING WILL RESULT IN A PROGRAM "HALT" OR A "JUMP TO SELF", WHICH MAY OCCUR IN ANY FIELD. DEPENDING ON THE PORTION OF THE TEST EXECUTED, ERRORS MAY BE IDENTIFIED BY REFERENCING THE PROGRAM LISTING.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP8-E COMPUTER WITH THE KMB-E OPTION INSTALLED AND AT LEAST 4K OF EXTENDED MEMORY.

2.2 STORAGE

THE PROGRAM REQUIRES 4200(8) LOCATIONS OF CORE MEMORY AND MUST RESIDE IN FIELD 0 ONLY.

2.3 PRELIMINARY PROGRAMS

ALL THE PROGRAMS FOR THE BASIC PDP8-E MUST HAVE BEEN RUN SUCCESSFULLY.

3. LOADING PROCEDURE

3.1 METHOD

THE PROGRAM IS LOADED INTO "FIELD 0" USING THE STANDARD BINARY LOADER TECHNIQUE.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SR 9, 10, AND 11 MUST CONTAIN AN OCTAL VALUE EQUAL TO THE NUMBER OF EXTENDED FIELDS AVAILABLE. NOTE THAT FIELD 0 IS NOT INCLUDED.

SR0=0 WILL RESULT IN COMPLETE PROGRAM EXECUTION OF THE MEMORY

EXTENSION AND TIME SHARE CONTROL.

SR0=1 WILL LOOP THE PROGRAM ON THE MEMORY EXTENSION PORTION
AND TEST THAT THE TIME SHARE IS DISABLED.

SR1=1 WILL RESULT IN AN END OF TEST HALT AT LOCATION 1565(8).

4.2 STARTING ADDRESS

THE STARTING ADDRESS IS LOCATION 0200(8).

4.3 OPERATOR ACTION

4.3.1 MEMORY EXTENSION AND TIME SHARE CONTROL (TIME SHARE ENABLED)

WITH THE PROGRAM IN MEMORY; SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD RUN UNTIL A FAILURE OCCURS OR UNTIL
STOPPED BY THE OPERATOR WITH SR1=1. NOTE THAT THE PROGRAM
SHOULD ALWAYS BE STOPPED WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFUL TEST AT THE COMPLETION
OF EVERY PASS.

4.3.2 MEMORY EXTENSION PORTION (TIME SHARE DISABLED)

WITH THE PROGRAM IN MEMORY; SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE SWITCH REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PLACE SR0=1 TO EXECUTE MEMORY EXTENSION ONLY.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD HALT AT LOCATION 3651(8). THIS WILL

VERIFY THAT THE TIME SHARE IS DISABLED. ALL OTHER ERRORS
AT THIS TIME WILL BE CONSIDERED AS AN ILLEGAL CONDITION.

PRESS CONTINUE.

THE PROGRAM SHOULD LOOP UNTIL AN ERROR OCCURS OR UNTIL STOPPED
BY THE OPERATOR WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFULL TEST AT THE END
OF EVERY PASS.

5. OPERATING PROCEDURE

5.1 OPERATOR ACTION

5.1.1 MEMORY EXTENSION AND TIME SHARE CONTROL

VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "OUT"
ON THE M637 MODULE AND FOLLOW THE OPERATOR ACTION IN 4.3.

5.1.2 MEMORY EXTENSION PORTION

VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "IN"
ON THE M637 MODULE AND FOLLOW THE OPERATOR ACTION 4.3.

6. ERRORS

6.1 ERROR DESCRIPTION

BOTH "HALTS" AND "JUMP TO SELF" ARE USED TO INDICATE ERROR
CONDITIONS. IN EITHER CASE REFER TO THE PROGRAM LISTING
FOR MORE INFORMATION.

6.2 ERROR RECOVERY

ALL ERRORS ENCOUNTERED MUST BE CORRECTED BEFORE PROCEEDING
ON IN THE PROGRAM.

7. RESTRICTIONS

7.1 OPERATING RESTRICTIONS

PDP8-E ONLY WITH THE KM8-E OPTION INSTALLED AND AT LEAST 4K
OF EXTENDED MEMORY.

THE NUMBER OF EXTENDED AVAILABLE FIELDS MUST BE IN SR9=11.

IF MEMORY EXTENSION ONLY, THE TIME SHARE MUST BE DISABLED
AND SR0=1.

IF MEMORY EXTENSION AND TIME SHARE CONTROL, THE TIME
SHARE MUST BE ENABLED AND SR0=0.

IN ALL CASES SR1=1 MUST BE USED TO STOP PROGRAM.

THE PROGRAM MUST RESIDE IN FIELD 0 ONLY.

BOTH PORTIONS OF THE TEST MUST BE RUN, 4.3.1 AND 4.3.2, TO
VERIFY THAT THE TIME SHARE CAN BE DISABLED AND ENABLED.

8. MISCELLANEOUS

8.1 EXECUTION TIME

EXECUTION TIME DEPENDS ON THE AMOUNT OF AVAILABLE EXTENDED
FIELDS. EXECUTION TIME FOR 32K APPROXIMATIVELY 3.75 MINUTES.

9. PROGRAM DESCRIPTION

THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH
THE MEMORY EXTENSION AND TIME SHARE CONTROL; THE ABILITY TO RUN
WITH THE TIME SHARE DISABLED; THE ABILITY TO RUN "EXECUTIVE"
AND "USER MODES" IN ALL AVAILABLE FIELDS WITH THE TIME SHARE
ENABLED; THE ABILITY TO REFERENCE ALL MEMORY FIELDS FROM FIELD 0
AND VICE-VERSA; THE ABILITY TO READ AND WRITE DATA IN ALL
AVAILABLE FIELDS AND THE ABILITY TO RUN PROGRAM INTERRUPTS
AND INTERRUPT INHIBIT IN ALL FIELDS.

THE TIME SHARE OPTION DEVELOPES A NEW MODE OF OPERATION OR
THE "USER MODE". ALL HLT, OSR, AND IOT INSTRUCTIONS ARE ILLEGAL
IN USER MODE AND SHOULD "TRAP OUT". THE PROGRAM WILL THEN
DETERMINE IF AN ERROR CONDITION DOES EXIST. IN SOME CASES,
IN TIME SHARING, AN ERROR CONDITION CANNOT BE INDICATED WITH
A "HLT" OR "TYPE OUT" BECAUSE THIS WOULD BE ILLEGAL.
THEREFORE A "JUMP TO SELF" IS USED TO INDICATE ERRORS.

9.1 TEST_00

TEST ODF AND RDF FOR ALL COMBINATIONS 0 TO 7.

9.2 TEST_01

TEST INTERRUPT BUFFER BITS 9-11 WITH RIB. PI IS ENABLED
AND TTY FLAG IS USED FOR INTERRUPTS. DO ALL COMBINATIONS
0 TO 7.

9.3 TEST 02

TEST DCA I AND TAD I TO ALL AVAILABLE FIELDS. EACH STACK
WILL CONTAIN ITS DF# IN LOCATION 7000.

9.4 TEST 03

TEST CIF INSTRUCTION. CHECKS THE ABILITY OF A CIF-ION=
NOP-JMP AND CIF-ION-NOP-JMS.

9.5 TEST 04

TEST GTF INSTRUCTION FOR TTY FLAG AND SAVE FIELD.
GET SAVE FIELD AFTER INTERRUPT AND CHECK INTERRUPT
INHIBIT. DO ALL COMBINATIONS 0 TO 7.

9.6 TEST 05

TEST ION AND LINK FROM RTF. TEST INTERRUPT INHIBIT BEFORE
PI. GET THE FLAGS WITH GTF.

9.7 TEST 06

TEST READ AND WRITE DATA IN ALL AVAILABLE EXTENDED FIELDS.

9.8 TEST 07

CONFIDENCE CHECK ON ALL EXISTENT FIELDS. MAKE SURE ALL
STACKS ARE ACCESSED CORRECTLY.

9.9 TEST 08

TEST DF AND IF FROM SAVE FIELD AFTER PI. USE RTF TO
SET THE FLAGS AND GTF TO GET THE FLAGS. CHECK INTERRUPT
INHIBIT. DO ALL SF COMBINATIONS 0 TO 77.

9.10 TEST 09

TEST PROGRAM INTERRUPT IN ALL AVAILABLE EXTENDED FIELDS.
USE RTF, GTF, RDF, AND RIF FOR CHECK.

9.11 TEST 10

TEST INTERRUPT INHIBIT IN ALL AVAILABLE EXTENDED FIELDS.
TEST CIF-ION-JMP COMBINATION.

9.12 TEST_11

TEST SAVE FIELD WITH RMF IOT.

9.13 TEST_12

TEST AUTO-INDEX IN ALL AVAILABLE EXTENDED FIELDS.

9.14 TEST_13

DYNAMIC RMF TEST, TEST ALL SF TO DF TRANSFERS AND SF
TO IB TRANSFERS.

9.15 TEST_14

TEST NON-EXISTENT FIELDS FOR ALL 0'S, IF 32K PRESENT
BY-PASS TEST.

9.16 TEST_15

TEST TIME SHARE IN FIELD 0.

9.17 TEST_16

TEST TIME SHARE IN ALL AVAILABLE EXTENDED FIELDS.

10. LISTING

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1      /PDP8-E, MEMORY EXTENSION AND TIME SHARE CONTROL TEST.
2      /
3      /COPYRIGHT 1970, DIGITAL EQUIPMENT CORP.,MAYNARD,MASS.
4      /
5      /STARTING ADDRESS IS 0200.
6      /
7      /CONSTANTS
8      /
9      6201 CDF=6201
10     6202 CIF=6202
11     6214 RDF=6214
12     6224 RIF=6224
13     6244 RMF=6244
14     6234 RIB=6234
15     6274 SUP=6274
16     6264 CUF=6264
17     6254 SINT=6254
18     6204 CINT=6204
19     6007 CAF=6007
20     6005 RTF=6005
21     6034 GTF=6034
22     6001 ION=6001
23     6002 IOF=6002
24     6000 SKON=6000
25     6003 SRQ=6003
26     6040 SPF=6040
27     6041 TSF=6041
28     6032 KCC=6032
29     6002 IOF=6002
30     6006 KRB=6006
31     6000 IOT=6000
32     /
33     *0
34     0004 0000 0000
35     0001 0001 0001
36     0002 0002 0002
37     0003 0003 0003
38     /
39     *20
40     /
41     0020 5400 JMP10, JMP I 0
42     0021 0000 ISZ0, ISZ 0
43     0022 2443 XYFLG, TFLG
44     0023 2435 XSTKS, NSTKS
45     0024 1000 XRMF, TRMF
46     0025 1321 XTRANS, TRANS
47     0026 1432 XAUTO, TAUTO
48     0027 0000 LOOP, 0
49     0030 0000 NDF, 0
50     0031 0000 STKS, 0
51     0032 0000 DAT, 0
52     0033 0000 NOSTAK, 0
53     0034 0000 NOFLD, 0
54     0035 1132 KCAIN, CAI-1
55     0036 1133 KCAI, CAI

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56	0037	7402	KHLT,	HLT
57	0040	6201	KCDF,	6201
58	0041	6202	KCIF,	6202
59	0042	1316	XFD,	EXFD
60	0043	0001	K1,	1
61	0044	0007	K7,	7
62	0045	0010	K10,	10
63	0046	7777	K7777,	7777
64	0047	7000	K7000,	7000
65	0050	7707	K7707,	7707
66	0051	7767	K7767,	7767
67	0052	7757	K7757,	7757
68	0053	7747	K7747,	7747
69	0054	7737	K7737,	7737
70	0055	7727	K7727,	7727
71	0056	7717	K7717,	7717
72	0057	7776	K7776,	7776
73	0060	7775	K7775,	7775
74	0061	7774	K7774,	7774
75	0062	7773	K7773,	7773
76	0063	7772	K7772,	7772
77	0064	7771	K7771,	7771
78	0065	0067	POINT,	.+2
79				
80				
81	0066	0067	K7S,	.+1
82	0067	7766	K7766,	7766
83	0070	7755		7755
84	0071	7744	K7744,	7744
85	0072	7733		7733
86	0073	7722		7722
87	0074	7711		7711
88	0075	7700		7700
89	0076	1127	XTDF,	STDF
90	0077	1130	XTDF1,	STDF+1
91	0100	1302	KXFLD,	EXFLD
92	0101	5402	KJMP,	JMP I 2
93	0102	1200	KNTR,	ENTER
94	0103	0020	K20,	20
95	0104	5505	JMP2,	JMP I KFLD0
96	0105	1427	KFLD0,	RTRN
97	0106	1422	KRTN,	CAG+2
98	0107	1440	XFIB,	SFIB
99	0110	7770	K7770,	7770
100	0111	0070	K0070,	0070
101	0112	0000	XSAV,	0000
102	0113	7770	XCOUNT,	7770
103	0114	0000	XTOR,	0000
104	0115	5200	K5200,	5200
105	0116	1200	K1200,	1200
106	0117	0077	K0077,	0077
107	0120	0011	K0011,	0011
108	0121	7700	K7700,	7700
109	0122	0002	K0002,	0002
110	0123	0004	K0004,	0004

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111 0124 7402 K7402, 7402
112 0125 6000 K6000, 6000
113 0126 0100 K0100, 0100
114 0127 0203 PLACE, BEGIN
115 0130 1000 K1000, 1000
116 0131 2600 TIME, T1
117 0132 0017 K0017, 0017
118 0133 6001 K6001, 6001
119 0134 5535 JMP I XRET
120 0135 2511 XRET, RET
121 0136 0000 XDATA, 0000
122 0137 0000 K0000, 0000
123 0140 0003 K0003, 0003
124 0141 0001 K0001, 0001
125 0142 1100 K1100, 1100
126 0143 7745 SRCO, 7745
127 0144 3577 K3577, 3577
128 0145 7745 K7745, 7745
129 0146 3033 XXSR0, XSR0
130 0147 1506 XELL, 0ELL+1
131 0150 1505 XBELL, BELL
132 0151 6046 TTR, TLS
133 0152 3643 XTRAP, TRAP
134 0153 5531 ATRAP, JMP I TIME
135 0154 0000 FCO, 0000
136 0155 2047 XDATER, DATER
137 0156 6211 K0DF1, CDF 10
138 0157 2525 K0DATER, 2525

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/TEST 00

/TEST CDF AND RDF, USE CDF TO SET THE DATA

/FIELD AND RDF TO READ THE DATA FIELD,

/DO ALL COMBINATIONS 0 TO 7,

/

0200

/

BEGIN1, LAS

SPA

JMP I XTRAP

BEGIN, CLA CLL

CAF

CUF

TAD KHLT

DCA 1

ION

/

DF0, CDF 00

RDF

SNA

JMP DF7

HLT

CLA

/STORE A HLT IN LOC. 1 AND

/CHECK FOR STRAY INTERRUPT RGST.

/DF 0

/SHOULD NOT SKIP

/ERROR, CDF OR RDF FAILED

166	0217	5211	JMP DF0	/REPEAT
167			/	
168	0220	1050	DF7, TAD K7707	/7707
169	0221	6271	CDF 70	/DF 7
170	0222	6214	RDF	
171	0223	7040	CMA	/AC = 0
172	0224	7450	SNA	/SHOULD NOT SKIP
173	0225	5231	JMP OK1	
174	0226	7402	HLT	/CDF OR RDF FAILED
175	0227	7200	CLA	
176	0230	5220	JMP DF7	
177			/	
178	0231	2027	OK1, ISZ LOOP	/CHECK DONE
179	0232	5211	JMP DF0	
180			/	
181	0233	7200	CLA	
182	0234	3027	OCA LOOP	/LOOP COUNTER
183			/	
184	0235	1051	DF1, TAD K7767	/7767
185	0236	6211	CDF 10	/DF 10
186	0237	6214	RDF	
187	0240	7040	CMA	/AC=0
188	0241	7450	SNA	
189	0242	5246	JMP DF2	
190	0243	7402	HLT	/CDF1 OR RDF FAILED
191	0244	7200	CLA	
192	0245	5235	JMP DF1	
193			/	
194	0246	1052	DF2, TAD K7757	/7757
195	0247	6221	CDF 20	/DF2
196	0250	6014	RDF	
197	0251	7040	CMA	/AC=0
198	0252	7450	SNA	
199	0253	5237	JMP OK2	
200				
201				
202	0254	7402	HLT	/CDF 2 OR RDF FAILED
203	0255	7200	CLA	
204	0256	5246	JMP DF2	
205			/	
206	0257	2027	OK2, ISZ LOOP	/DONE IF SKP
207	0260	5235	JMP DF1	
208	0261	7200	CLA	
209	0262	3027	OCA LOOP	
210			/	
211	0263	1053	DF3, TAD K7747	/7747
212	0264	6231	CDF 30	/DF 3
213	0265	6214	RDF	
214	0266	7040	CMA	/AC=0
215	0267	7450	SNA	
216	0270	5274	JMP DF4	
217	0271	7402	HLT	/CDF 3 OR RDF FAILED
218	0272	7200	CLA	
219	0273	5263	JMP DF3	
220			/	

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221 0274 1054 DF4, TAD K7737 /7737
222 0275 6241 CDF 40 /DF 4
223 0276 6214 RDF
224 0277 7040 CMA /AC=0
225 0300 7450 SNA
226 0301 5305 JMP OK3
227 0302 7402 HLT /CDF 4 OR RDF FAILED
228 0303 7200 CLA
229 0304 5274 JMP DF4
230
231 0305 2027 OK3, ISZ LOOP /DONE IF SKP
232 0306 5263 JMP DF3
233
234 0307 7200 CLA
235 0310 3027 DCA LOOP
236
237 0311 1055 DF5, TAD K7727 /7727
238 0312 6251 CDF 50 /DF5
239 0313 6214 RDF
240 0314 7040 CMA /AC=0
241 0315 7450 SNA
242 0316 5322 JMP DF6
243 0317 7402 HLT /CDF 5 OR RDF FAILED.
244 0320 7200 CLA
245 0321 5311 JMP DF5
246
247 0322 1056 DF6, TAD K7717 /7717
248 0323 6261 CDF 60 /DF 6
249 0324 6214 RDF
250 0325 7040 CMA /AC=0
251 0326 7450 SNA
252 0327 5303 JMP OK4
253
254 0330 7402 HLT /CDF 6 OR RDF FAILED
255 0331 7200 CLA
256 0332 5302 JMP DF6
257
258 0333 2027 OK4, ISZ LOOP /DONE IF SKP
259 0334 5311 JMP DF5
260 0335 6000 SKON /SKP IF ION
261 0336 7402 HLT /IS ION STILL ON
262
263 /TEST 01
264 /NOW TEST INTERRUPT BUFFER (IB) BITS 9-11 WITH
265 /RIB. PI IS ENABLED, TELEPRINTER FLAG IS
266 /USED FOR INTERRUPT, DO ALL COMBINATIONS 0 TO 7.
267
268 0337 6201 CDF 00 /DF0
269 0340 1000 TAD JMP10 /JMP10=JMP I 0
270 0341 3001 DCA 1 /C(1)=JMP I 0
271 0342 3027 DCA LOOP
272 0343 6041 TSF /TEST TTY FLAG
273 0344 4422 JMS I XTFLG /SET FLAG
274
275 0345 6001 IB0, ION /ENABLE PI

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276	0346	7200	CLĀ	
277	0347	6234	RIB	/READ SF
278	0350	7450	SNA	
279	0351	5354	JMP IB1	
280	0352	7402	HLT	/RIB FAILED
281	0353	5345	JMP IB0	
282			/	
283	0354	6211	IB1, CDF 10	/DF 1
284	0355	6001	ION	
285	0356	7200	CLĀ	
286	0357	6214	RDF	/DF SHOULD BE 0 AFTER A PI
287	0360	7450	SNA	
288	0361	5364	JMP ,+3	
289	0362	7402	HLT	
290	0363	5354	JMP IB1	/DF NOT CLEARED, OR NO PI
291			/.	
292	0364	1057	TAD K7776	
293	0365	6234	RIB	/READ SF
294	0366	7040	CMA	/AC=0
295	0367	7450	SNA	
296	0370	5373	JMP OK5	
297	0371	7402	HLT	/RIB OR SF FAILED
298	0372	5354	JMP IB1	
299	0373	5027	OK5, ISZ LOOP	/DONE IF SKP
300	0374	5345	JMP IB0	
301	0375	5776	JMP 1 ,+1	
302	0376	0400	IB2-2	
303				
304		0400	*400	
305	0400	7200	CLĀ	
306	0401	5027	DCA LOOP	
307				
308			/	
309	0402	6221	IB2, CDF 20	/DF 2
310	0403	6001	ION	
311	0404	7200	CLĀ	
312	0405	6214	RDF	/SHOULD BE 0 AFTER PI
313	0406	7450	SNA	
314	0407	5012	JMP ,+3	
315	0410	7402	HLT	/DF NOT CLEARED, OR NO PI
316	0411	5202	JMP IB2	
317			/	
318	0412	1060	TAD K7775	
319	0413	6234	RIB	/AC=7777
320	0414	7040	CMA	/=0
321	0415	7450	SNA	
322	0416	5221	JMP IB3	
323	0417	7402	HLT	/RIB OR SF FAILED
324	0420	5202	JMP IB2	
325			/	
326	0421	6231	IB3, CDF 30	/DF3
327	0422	6001	ION	
328	0423	7200	CLĀ	
329	0424	6214	RDF	/DF SHOULD BE CLEARED
330	0425	7450	SNA	

331	0426	5231	JMP ,+3	
332	0427	7402	HLT	/DF NOT CLEARED
333	0430	5221	JMP IB3	
334			/	
335	0431	1061	TAD K7774	
336	0432	6234	RIB	/AC=7777
337	0433	7040	CMA	/AC=0
338	0434	7450	SNA	
339	0435	5240	JMP OK6	
340	0436	7402	HLT	/RIB OR SF FAILED
341	0437	5221	JMP IB3	
342			/	
343	0440	2027	OK6, ISZ LOOP	/DONE IF SKP
344	0441	5202	JMP IB2	
345			/	
346	0442	7200	CLA	
347	0443	3027	DCA LOOP	
348			/	
349	0444	6241	IB4, CDF 40	/DF 3
350	0445	6001	ION	
351	0446	7200	CLA	
352	0447	6214	RDF	/DF MUST BE 000 AFTER A PI
353	0450	7450	SNA	/ERROR IF SKIP
354	0451	5254	JMP ,+3	
355				
356				
357	0452	7402	HLT	/DF NOT 0 AFTER PI
358	0453	5244	JMP IB4	
359			/	
360	0454	1062	TAD K7773	/AC=7773
361	0455	6034	RIB	/AC=7777
362	0456	7040	CMA	/AC=0
363	0457	7450	SNA	
364	0460	5253	JMP IB5	
365	0461	7402	HLT	/RIB OR SF FAILED
366	0462	5244	JMP IB4	
367			/	
368	0463	6251	IB5, CDF 50	/DF5
369	0464	6001	ION	
370	0465	7200	CLA	
371	0466	6214	RDF	/DF SHOULD=000
372	0467	7450	SNA	
373	0470	5273	JMP ,+3	
374	0471	7402	HLT	/DF NOT 0 AFTER PI
375	0472	5263	JMP IB5	
376			/	
377	0473	1063	TAD K7772	/AC = 7772
378	0474	6234	RIB	/AC = 7777
379	0475	7040	CMA	/AC = 0000
380	0476	7450	SNA	
381	0477	5302	JMP OK7	
382	0500	7402	HLT	/RIB OR SF FAILED
383	0501	5263	JMP IB5	
384			/	
385	0502	2027	OK7, ISZ LOOP	/DONE IF 0 AND SKIP

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386      0503 5244      JMP IB4
387
388      0504 7200      /      CLA
389      0505 3027      DCA LOOP
390
391      0506 6261      IB6,   CDF 60      /DF6
392      0507 6001      ION
393      0510 7200      CLA
394      0511 6214      ROP      /DF MUST=0 AFTER PI
395      0512 7450      SNA
396      0513 5316      JMP ,+3
397      0514 7402      HLT      /DF NOT 0 AFTER PI
398      0515 5306      JMP IB6
399
400
401      0516 1064      /      TAD K7771      /7771
402      0517 6234      RIB      /AC=7777
403      0520 7040      CMA
404      0521 7450      SNA
405      0522 5325      JMP IB7
406      0523 7402      HLT      /RIB OR SF FAILED
407      0524 5306      JMP IB6
408
409      0525 6271      IB7,   CDF 70      /DF 7
410      0526 6001      ION
411      0527 7200      CLA
412      0530 6214      ROP      /DF MUST = 0 AFTER PI
413      0531 7450      SNA
414      0532 5305      JMP ,+3
415      0533 7402      HLT      /DF NOT 0
416      0534 5325      JMP IB7
417
418      0535 1010      /      TAD K7770
419      0536 6234      RIB      /AC=7777
420      0537 7040      CMA
421      0540 7450      SNA
422      0541 5344      JMP OK8
423      0542 7402      HLT      /RIB OR SF FAILED
424      0543 5325      JMP IB7
425
426
427      0544 2027      OK8,   ISZ LOOP      /DONE IF SKP
428      0545 5306      JMP IB6
429      0546 5747      JMP I ,+1      /NEW PAGE
430      0547 0500      600
431
432
433      0600      *600
434      /TEST 02
435      /NOW TEST DCA I AND TAD I TO ALL STACKS, NUMBER OF
436      /EXTENDED STACKS SHOULD BE IN SR9 TO 11, EACH STACK WILL
437      /CONTAIN ITS DF# IN LOCATION 7000,
438      /
439      0600 3027      DCA LOOP
440      0601 4423      DCAI,   JMS I XSTKS      /READ SR 9-11

```

```

441 0602 7001 IAC
442 0603 3030 DCA NDF /DF NUMBER = 1 TO START
443 0604 1040 TAD KCDF /6201
444 0605 1045 TAD K10
445 0606 3207 DCA ,+1 /DF 001 TO START WITH
446 0607 6201 DFLO, CDF 00 /WILL BE INCREMENTED
447 0610 1030 TAD NDF /DF#
448 0611 3447 DCA I K7000 /PUT IN 7000 OF STACK
449 0612 2031 ISZ STKS /ALL STACKS WHEN 0
450 0613 7410 SKP
451 0614 5222 JMP TADI /TEST TAD I
452 0615 1045 TAD K10
453 0616 1207 TAD DFLO /INCR. CDF IOT
454 0617 3207 DCA DFLO
455 0620 2030 ISZ NDF
456 0621 5207 JMP DFLO
457
458 0622 4423 TADI, JMS I XSTKS /SR9-11 AGAIN
459 0623 7001 IAC
460 0624 3030 DCA NDF /DF#=1 AGAIN
461 0625 1040 TAD KCDF /6201
462 0626 1045 TAD K10
463 0627 3230 DCA ,+1
464 0630 6201 TFLO, CDF 00
465 0631 1047 TAD I K7000 /AC=DF CONTENTS NOW
466 0632 3032 DCA DAT /SAVE TEMP
467 0633 1032 TAD DAT
468 0634 7041 CIA /2'S COMP
469 0635 1030 TAD NDF /BETTER BE EQUAL
470 0636 7040 SZA CLA
471 0637 5200 JMP CAA-1 /ERROR PATH
472 0640 0031 ISZ STKS /ALL WHEN 0
473 0641 5045 JMP ,+4
474 0642 0007 ISZ LOOP /DONE WHEN 0
475 0643 5201 JMP DCAI
476 0644 5206 JMP IBSF /NEXT TEST
477 0645 1045 TAD K10
478 0646 1230 TAD TFLO /CDF IOT + 10
479 0647 3230 DCA TFLO
480 0650 2030 ISZ NDF
481 0651 5230 JMP TFLO
482
483 0652 1032 TAD DAT /DATA AS READ
484 0653 7002 CAA, HLT /AC=DATA READ
485 0654 7200 CLA
486 0655 5230 JMP TFLO
487
488 /TEST 03
489
490 /CIF TEST, CHECKS THE ABILITY OF A CIF-ION-NOP-JMP OR
491 /CIF-ION-NOP-JMS SEQUENCE TO DO THE FOLLOWING:
492 /1, CIF ENABLE MB TO IB TRANSFER,
493 /2, INHIBIT INTERRUPT TILL JMP OR JMS EXECUTED,
494 /3, INTERRUPT AFTER JMP OR JMS EXECUTED,
495 /4, JMP OR JMS ENABLES IB TO IF TRANSFER,

```



```

496                                     /5, INTERRUPT ENABLES IF TO SF TRANSFER,
497
498 /SET UP FOR CIF=ION=NOP-JMP CHECK,
499 0656 6201 1BSF, CDF 00 /SET LOCS 1-2 TO ISZ 0,
500 0657 1021 TAD ISZ0 /JMP I 0 RESPECTIVELY,
501 0660 3001 DCA 1
502 0661 1352 TAD KNOP
503 0662 3002 DCA 2
504 0663 1020 TAD JMP10
505 0664 3003 DCA 3
506
507 /NOW STORE HALTS IN LOC1, CIFJMP+1,
508 /AND CIFJMS+1 OF ALL EXTENDED FIELDS,
509
510 0665 4423 JMS I XSTKS
511 0666 1040 TAD KCDF
512 0667 1045 TAD K10
513 0670 3271 DCA ,+1
514 0671 6211 HLTS, CDF 10
515 0672 1037 TAD KHLT
516 0673 3443 DCA I K1
517 0674 1037 TAD KHLT
518 0675 3754 DCA I CAB
519 0676 1037 TAD KHLT
520 0677 3755 DCA I CAC
521 0700 2031 ISZ STKS
522 0701 7410 SKP
523 0702 5305 JMP ,+3
524 0703 1071 TAD HLTS
525 0704 5007 JMP HLTS-2
526 0705 6001 CDF 00
527 0706 6001 TSF /ENSURE TIO FLAG SET,
528 0707 1002 JMS I XTFLG
529 0710 3027 DCA LOOP /SET COUNTER FOR 4096 PASSES,
530 0711 1041 AGAIN1, TAD KCIF /INITIALIZE TO CIF 00,
531 0712 3323 DCA CIFJMP
532 0713 3353 DCA CIFCK /INITIALIZE I.F. CHECK TO 0,
533 0714 4423 JMS I XSTKS /READ SR9-11,
534 0715 1323 CIFJPL, TAD CIFJMP
535 0716 1045 TAD K10
536 0717 3023 DCA CIFJMP
537 0720 1353 TAD CIFCK
538 0721 1045 TAD K10
539 0722 3353 DCA CIFCK
540 0723 6202 CIFJMP, CIF 00 /MODIFIED TO CURRENT FIELD
541 /UNDER TEST,
542
543
544 0724 6001 ION
545 0725 7000 NOP
546 0726 5327 JMP ,+1
547 0727 7402 HLT
548 0730 6234 RIB
549 0731 7041 CIA
550 0732 1353 TAD CIFCK

```

/ERROR, NO PI OR INHIBIT PI

```

551 0733 7650      SNA CLA
552 0734 5344      JMP      CAD+3
553 0735 1353      TAD      CIFCK
554 0736 7110      CLI      RAR
555 0737 7012      RTR
556 0740 6234      RIB
557 0741 7402      CAD,    HLT
558 0742 7200      CLA
559 0743 5323      JMP      CIFJMP
560
561 0744 2031      ISZ      STKS
562 0745 5315      JMP      CIFJPL
563 0746 2027      ISZ      LOOP
564 0747 5311      JMP      AGAIN1
565 0750 5751      JMP      I      .+1
566 0751 1000      IBSF1
567 0752 7000      KNOP,   NOP
568 0753 0000      CIFCK,   0
569 0754 0724      CAB,     CIFJMP+1
570 0755 1020      CAC,     CIFJMS+1
571
572
573
574 1000 7200      *1000
575 1001 6201      IBSF1,   CLA
576 1002 6041      CDF      00
577 1003 4422      TSF
578 1004 3027      JMS      I      XTFLG
579 1005 1001      DCA      LOOP
580 1006 1001      AGAIN2,  TAD      KCIF
581 1007 3217      DCA      CIFJMS
582 1008 3146      DCA      CIFCK1
583 1009 4323      JMS      I      XSTKS
584 1010 3217      CIFJSL,  TAD      CIFJMS
585 1011 1309      TAD      K10
586 1012 3217      DCA      CIFJMS
587 1013 1246      TAD      CIFCK1
588 1014 1045      TAD      K10
589 1015 3246      DCA      CIFCK1
590 1016 6202      CIFJMS,  CIF      00
591
592 1020 6041      ION
593 1021 7100      NOP
594 1022 4223      JMS      .+1
595 1023 0000      0
596 1024 7402      HLT
597 1025 6234      RIB
598 1026 7041      CIA
599 1027 1246      TAD      CIFCK1
600 1030 7650      SNA      CLA
601 1031 5241      JMP      CAE+3
602 1032 1246      TAD      CIFCK1
603 1033 7110      CLI      RAR
604 1034 7012      RTR
605 1035 6234      RIB

```

```

/ERROR: I.B. TO I.F. TRANSFER
/FAILED AFTER CIF-JMP, BAD
/I.F. IN AC6-8, GOOD I.F. IN
/AC9-11, REPEAT UPON CONTINUE,
/DONE?
/NO, DO NEXT FIELD
/4096 TIMES?
/NO, DO IT ALL AGAIN,
/YES, GO TEST CIF-JMS,

```

/ENSURE T10 FLAG SET.

```

/SET UP FOR 4096 PASSES.
/INIT. TO CIF 00.

```

```

/INIT. I.F. CHECK TO 0.
/READ SR9-11.

```

```

/MODIFIED TO CURRENT FIELD
/UNDER TEST.

```

/ERROR: NO PI OR INHIBIT PI.

606	1036	7402	CAE:	HLT	/ERROR: I.F. TO I.F. TRANSFER
607	1037	7200		CLA	/FAILED AFTER CIF-JMS. BAD
608	1040	5217		JMP	/I.F. IN AC6-8. GOOD I.F.
609				CIFJMS	/IN AC9-11. REPEAT UPON CONTINUE
610	1041	2031		ISZ	/DONE?
611	1042	5211		JMP	/NO. DO NEXT FIELD.
612	1043	2027		ISZ	/4096 TIMES?
613	1044	5205		JMP	/NO. DO IT ALL AGAIN.
614	1045	5647		JMP I	/YES. GO ON TO NEXT TEST
615	1046	0000		CIFCK1,0	
616	1047	2271		XGTF1, GTF1	

/

/TEST 10

/TEST INTERRUPT INHIBIT

/FROM EACH FIELD. REFER TO HEADING TITLED "EXTENDED

/FIELD TEST ROUTINE". THIS ROUTINE IS PLACED IN

/EACH TESTED FIELD AT THE ADDRESSES SPECIFIED. THE

/INDICATED ERROR HALTS WILL BE IN THE EXTENDED

/FIELD. PRESS CONT. TO RECOVER. ONLY 1 FIELD WILL

/CONTAIN THE ROUTINE AT ANY ONE TIME. OTHER FIELDS

/WILL CONTAIN ALLOIS. THE ROUTINE IS REPLACED WITH

/HALTS AFTER COMPLETION. THE PORTIONS OF THE FIELD

/WHICH DO NOT CONTAIN THE ROUTINE ARE SET TO 0000

/BEFOREHAND.

/

/SETUP FIELDS TO TEST. POINTERS, ETC.

TRMF:	JMS I XSTKS	/READ SR9-11
	TAD KODF	/6201
	DCA .+6	
	TAD .+5	
	TAD K10	
	DCA .+3	
	CMA	
	DCA 10	
	CDF 00	
	DCA I 10	/PLACE 0'S IN EACH FIELD FROM
	TAD 10	/LOC. 0 TO 7777.
	CMA	
	SZA CLA	
	JMP .-4	
	ISZ STKS	
	JMP TRMF+3	

/

/NOW PUT A HLT IN EACH FIELD IN THE SAME

/LOCATION AS CAI, BELOW.

657	1070	4423		JMS I XSTKS	/READ SR 9-11
658	1071	1040		TAD KODF	
659	1072	1045		TAD K10	
660	1073	3274		DCA .+1	

661	1074	6201	CHDF,	ODF 00	
662	1075	1036		TAD KCAI	/KCAI = ADDRESS OF CAI
663	1076	3027		DCA LOOP	/SAVE TEMPORARILY
664	1077	1037		TAD KHLT	/KHLT = 7402 (HLT)
665	1100	3427		DCA I LOOP	
666	1101	2031		ISZ STKS	/DONE ALL STACKS WHEN SKIP
667	1102	7410		SKP	
668	1103	5306		JMP I+3	
669	1104	1274		TAD CHDF	
670	1105	5272		JMP CHDF+2	
671			/		
672	1106	6201		ODF 00	
673	1107	6041	STRMP,	ISZ	/CHECK TTY FLAG
674	1110	4422		JMS I XTFLG	/GO SET IT
675	1111	1000		TAD K7707	
676	1112	3027		DCA LOOP	
677	1113	1065		TAD POINT	
678	1114	3066		DCA K7S	/POINTER FOR K7700 TO K7766
679	1115	4423		JMS I XSTKS	/READ SR 9-11
680	1116	1040		TAD KCDF	/6201
681	1117	1045		TAD K10	/10
682	1120	3327		DCA STDF	
683	1121	1041		TAD KCIF	/6202
684	1122	1045		TAD K10	/10
685	1123	3330		DCA STDF+1	
686	1124	1330		TAD STDF+1	
687	1125	3442		DCA I XFD	
688	1126	4425		JMS I XTRANS	/PUT TEST ROUTINE INTO FIELD X
689			/		
690	1127	6211	STDF,	ODF 10	/FIELD 1 TO START WITH
691	1130	6212		CIF 10	
692	1131	5030		JMP I+1	/SHOULD ENTER EXTENDED FIELD
693					/AFTER THIS JMP, HLT IF NOT
694	1132	7410		NOF	
695	1133	7402	CAI,	HLT	/ERROR, PI FAILED
696					/C(AC) = C(I.B.)
697	1134	5327		JMP STDF	/REPEAT SAME TEST
698			/		
699					
700					
701			/ENTER HERE AFTER PI FROM EXTENDED BANK		
702		1200	*1200		
703			/		
704	1200	6214	ENTER,	ODF	/DF SHOULD BE 000
705	1201	7450		SNF	/ERROR IF SKIP
706	1202	5206		JMP I+4	/CHECK C(SF)
707	1203	7402		HLT	/AC=C(DF)
708	1204	7200		CLA	
709	1205	5476		JMP I XTDF	/REPEAT TEST
710	1206	6212		CIF 10	/SET I.B. TO FIELD 1
711	1207	6244		RMF	/I.B. NOW EQUAL TO SF
712	1210	6234		RIB	/READ IB
713	1211	6202		CIF 00	
714	1212	6201		ODF 00	
715	1213	1466		TAD I K7S	

```

716 1214 7240 CMA
717 1215 7650 SNA CLA /ERROR IF SKIP
718 1216 5226 JMP CKPC
719 1217 6244 RMF
720 1220 6234 RIS
721 1221 7402 HLT /ERROR RMF AND PI WORKED, BUT
722 / /I.B. NOT CORRECT AFTER RMF.
723 1222 7200 CLA /AC=C(1B)
724 1223 6201 CDF 00
725 1224 6202 CIF 00
726 1225 5476 JMP I XTDF /BACKUP A PAGE AND REPEAT
727 /
728 1226 1036 CKPC. TAD KCAI /KCAI=ADDRESS OF CAI
729 1227 7001 IAC /MAKE CAI+1
730 1230 7041 CIA
731 1231 1000 TAD 0 /COMPARE TO C(0)
732 1232 7650 SNA CLA /SHOULD NOT SKIP
733 1233 5240 JMP ,+5 /ALL OK SETUP FOR NEXT FIELD
734 1234 1000 TAD 0
735 1235 7402 HLT /ERROR, ALL WORKED, BUT
736 /C(PC) WAS NOT=TO CAI+1
737 /AFTER PI IN EXTENDED
738 /FIELD, C(AC)=C(0),F0.
739 /CHECK FOR PI NOT INHIBITED.
740 /OR AUTO-INDEX REG.
741 /12 FAILING IN THE EXTENDED FIELD.
742 1236 7200 CLA
743 1237 5476 JMP I XTDF /BACKUP AND REPEAT
744 /
745 /SETUP FOR NEXT FIELD
746 /
747 1240 2001 ISZ STKS /DONE ALL IF SKIP
748 1241 5240 JMP ,+5
749 1242 2027 ISZ LOOP /DONE LOOPING IF SKIP
750 1243 5048 JMP I ,+2 /REPEAT ALL AGAIN
751 1244 5007 JMP I XFIB /EXIT TO NEXT TEST
752 1245 1113 STRMF+4 /BACK TO LAST PAGE
753
754 /
755 /
756 /SET LAST TESTED FIELD TO ALL 0'S AND PUT A
757 /HLT IN RESPECTIVE ADDRESS OF CAI
758 /
759 1246 7240 CLA CMA
760 1247 3010 DCA 10
761 1250 1476 TAD I XTDF /CDF X0 AT STDF
762 1251 3252 DCA ,+1
763 1252 6211 CDF 10 /F1 TO START WITH
764 1253 3410 DCA I 10
765 1254 1010 TAD 10
766 1255 7040 CMA
767 1256 7640 SZA CLA /CLEARD IF SKIP
768 1257 5253 JMP ,+4
769 1260 6201 CDF 00
770 1261 1476 TAD I XTDF /CDF X0 AT STDF

```

771	1262	3263	DCA ,*1	
772	1263	6211	CDF 10	
773	1264	1037	TAD KHLT	/=7402 (HLT)
774	1265	3436	DCA I KCAI	/KCAI=ADDRESS OF CAI
775	1266	6201	CDF 00	/RESTORE DF
776			/	
777			/INCREMENT CDF AND CIF 10'S AT STDF, STDF+1	
778			/TO NEXT FIELD.	
779			/	
780	1267	1476	TAD I XTDF	/CDF X0 AT STDF
781	1270	1045	TAD K10	
782	1271	3476	DCA I XTDF	
783	1272	1477	TAD I XTDF1	/CIF X0 AT STDF
784	1273	1045	TAD K10	
785	1274	3477	DCA I XTDF1	
786	1275	1477	TAD I XTDF1	
787	1276	3316	DCA EXFD	
788	1277	2066	ISZ K7S	
789	1300	4321	JMS TRANS	/PUT ROUTINE IN NEW FIELD
790	1301	5476	JMP I XTDF	/TEST NEW FIELD
791				
792			/EXTENDED FIELD TEST ROUTINE	
793			/	
794				
795			/THE FOLLOWING INSTRUCTIONS ARE PLACED IN	
796			/EACH EXTENDED FIELD TESTED. THE NUMBERS IN THE	
797			/COMMENTS FIELD CORRESPOND TO THE	
798			/MEMORY LOCATIONS IN THE TESTED FIELD. LOCATIONS	
799			/0 THRU 11 ARE USED FOR AN ERROR ROUTINE	
800			/IN CASE FIELD 0 IS NOT ENTERED AFTER AN	
801			/INTERRUPT, THE EXTENDED FIELD SHOULD BE	
802			/ENTERED AT LOCATION CAI-1 WHICH CORRESPONDS	
803			/TO CAI-1 IN FIELD 0.	
804			/	
805			/EXTENDED FIELD INSTRUCTIONS:	
806			/	
807	1302	0000	EXFLD, 0	/0
808	1303	1000	TAD 0	/1
809	1304	7450	SNA	/IF LOC' 0 NOT =0 RI DIDN'T
810				/ENTER FIELD 0
811	1305	5312	JMP ,+5	/3
812	1306	7402	HLT	/4. INTERRUPTED TO THIS FIELD
813				/INSTEAD OF FIELD 0. C(AC)=C(0)
814				/WHICH SHOULD BE CAI+1
815				/IF NOT, CHECK LOC. 7777. IT
816				/MUST = 5412 (JMP I 12).
817	1307	7200	CLA	/5
818	1310	3000	DCA 0	/6
819	1311	5420	JMP I 20	/7. C(20) =CAI
820	1312	7402	HLT	/10. THE JMP I 12 AT LOC'
821				/7777 WAS NOT EXECUTED.
822				/OR INTERRUPT FAILED. IF
823				/NO INTERRUPT, LOCATION 12
824				/NOW CONTAINS 0 INSTEAD
825				/OF ADDRESS CAI.

```

826 1313 5307      JMP I-4 /11. REPEAT IN THIS FIELD
827 1314 1133      CAI      /12. AUTO-INDEXS TO CAI+1
828                /IN F 0 IF THE JMP I 12
829                /WORKS,
830                /LOCS. 13 TO 17 ARE ALL 0'S
831                /
832 1315 1133      CAI      /20. EQUALS CAI IN F0.
833                /
834                /LOCS. 21 TO CAI-2 ARE ALL 0'S
835                /
836 1316 6212      EXFD,   CIF 10 /FIELD 1 TO START WITH
837 1317 6001      ION     /LOC. CAI. SEE SYMBOL TABLE
838                /FOR CAI.
839                /LOCS. CAI+1 TO 7776 ARE ALL 0'S
840                /
841 1320 5412      .       JMP I 12      /7777. PI SHOULD OCCUR,
842                /AFTER THIS INSTRUCTION,
843                /TO FIELD 0.
844
845
846
847                /ROUTINE TO TRANSFER TEST ROUTINE TO PROPER FIELD
848                /
849 1321 0000      TRANS, 0
850 1322 1101      TAD KJMP      /KJMP=JMP I 2
851 1323 3001      DCA 1        /IN FIELD 0
852 1324 1102      TAD KNTR      /KNTR = LOC. ENTER
853 1325 3002      DCA 2        /OF FIELD 0
854 1326 1100      TAD KXFLD     /KXFLD = LOC. EXFLD
855 1327 3000      DCA 10
856 1328 3011      DCA 11
857 1329 1007      TAD K7766     /1-10 DECIMAL
858 1330 3000      DCA 0        /SAVE
859 1331 1473      TAD I XTDF     /CDF X0 IN STDF
860 1332 3000      DCA I+3
861 1333 6201      CDF 20
862 1334 1410      TAD I 10
863 1335 6211      TRFLD, CDF 10 /F1 TO START WITH
864 1336 3411      DCA I 11      /PUT IN EXTENDED FIELD
865 1337 2000      ISZ 0        /DONE LOCS 1 TO 12 IF SKIP
866 1338 5335      JMP I-5
867 1339 1337      TAD TRFLD
868 1340 3047      DCA I+3
869 1341 6001      CDF 00
870 1342 1410      TAD I 10
871 1343 6211      CDF 10
872 1344 3000      DCA I K20     /PUT 500 IN LOC. 20
873 1345 6001      CDF 00
874 1346 1337      TAD TRFLD
875 1347 3000      DCA I+2
876 1348 1410      TAD I 10
877 1349 6211      CDF 10
878 1350 3435      DCA I KCAIM   /PUT CIF X0 IN CAI-1
879 1351 6201      CDF 00
880 1352 1337      TAD TRFLD

```



```

930
931      1427  2027      RTN,      ISZ LOOP      /WORKED OK
932      1430  5216      JMP CAG-2      /LOOP
933      1431  5232      JMP TAUTO      /DONE, GO TO NEXT TEST

```

```

/
/
/TEST 12
/TEST ALL AUTO-INDEX REGISTERS IN EACH EXTENDED FIELD.
/IDENTICAL TEST ROUTINES ARE PERFORMED FROM EACH FIELD.
/AND ERROR HALTS OCCUR IN THE FIELD CURRENTLY RUNNING
/THE ROUTINE. PRES. COUNT. TO RESUME TESTING, EACH
/FIELD CONTAINS ALL EXCEPT FOR THE AREA OCCUPIED
/BY THE TEST ROUTINE. FIELDS ARE SEQUENTIALLY
/ENTERED EACH TEST, AND THE NEXT SEQUENTIAL
/TEST THEN ENTERED, UNTIL THE HEADLINE "AUTO-
/INDEX TEST" FOR THE SEQUENCE OF OPERATIONS.

```

```

TAU001      CUF    WZ  

            TAD    K7786/  

            DCA    LOOP  

            GMS    IXXXXX IS  

            TAU    KLXXXI  

            DCA    UFFNNN  

NEWDEF1     TAU    UFFNNN  

            TAU    KIENNN  

            DCA    UFFNNN

```

7 CLEAR ONE FIELD TO 2

U.S. AIR FORCE
OFFICE OF THE
JOINT CHIEFS OF
STAFF
WASHINGTON, D.C.
20330-3100

7. NOW PUT TEST ROUTINE IN THE EXTENDED FIELD

MOVE.

```

1471 1471 2400 JMP MOVE
1472 1472 2400
1473 1473 2400
1474 1474 2400
1475 1475 2400
1476 1476 2400
1477 1477 2400
1500 1500 5275
1501 1501 7140
1502 1502 3446
1503 1503 6214
1504 1504 1141
1505 1505 3306
1506 1506 6212
1507 1507 4716

/ NOW SET AUTO-INDEX REGS 10 TO 17 TO 7777
/
TAD K7770 279 DECIMAL
DCA 0
TAD R7
DCA 10
CMA 7777
DCA 1 10
ISZ 0 10 TO 17 = 7777 WHEN SKIP
JMP 175
CMA
DCA 1 K7777 /PUT 7777 IN LOC. 7777 OF EXTENDED FIELD
RUF /READ D.F.
TAD KCIF /6202
DCA 10
CIF 10 /FIELD 1 TO START
JMS 1 FILOX /ENTER EXTENDED FIELD
/515 OCTAL LOC. BEFORE THE
/ TAD I 10 INSTRUCTION,
/ THIS IS A TEST OF THE
/ DEFER BIT, 500 US DELAY

/
/ ENTER FIELD 0 FROM EXTENDED FIELD HERE.
/
GOTO0, ISZ SIKS /DONE ALL WHEN SKIP
JMP NEWDF /SETUP FOR NEXT
ISZ LOOP /ALL DONE IF SKIP
JMP NEWDF-3 /REPEAT ALL
JMP 1 LBTP
LBTP, RMFIST
/
FILOX, DOAUTO-515

/
/ AUTO-INDEX TEST
/
/ THE ROUTINE WILL BE PLACED IN THE SAME RESPECTIVE
/ LOCATIONS IN EACH EXTENDED FIELD, ANY ERROR
/ HALT WILL OCCUR IN THE EXTENDED FIELD, PRESS
/ CONTINUE TO PROCEED WITH TESTING, THE INDEX
/ REGISTERS 10 TO 17 INITIALLY CONTAIN 7777, AND
/ ARE AUTO-INDEXED TO 0000 BY A TAD I INSTRUCTION,
/ A HALT OCCURS IF THE REG. IS NOT INCREMENTED TO 0,
/ THE TAD I WOULD HAVE THEN REFERENCED LOC. 7777,
/ WHICH CONTAINS 7777.
/
1517 1517 1517 DOAUTO, /THIS LOC. IS NOT MOVED TO
/ THE EXTENDED FIELD,
CLA
TAD 1 10
1520 1520 7200
1521 1521 1410

```

```

1040 1522 7440 SZA
1041 1523 7402 HLT /ERROR, INDEX REG, 10 FAILED
1042 1524 1411 TAD I 11
1043 1525 7440 SZA
1044 1526 7402 HLT /INDEX REG, 11 FAILED
1045 1527 1412 TAD I 12
1046 1528 7440 SZA
1047 1529 7402 HLT /12 FAILED
1048 1530 1413 TAD I 13
1049 1531 7440 SZA
1050 1532 7402 HLT /13 FAILED
1051 1533 1414 TAD I 14
1052 1534 7440 SZA
1053 1535 7402 HLT /14 FAILED
1054 1536 1415 TAD I 15
1055 1537 7440 SZA
1056 1538 7402 HLT /15 FAILED
1057 1539 1416 TAD I 16
1058 1540 7440 SZA
1059 1541 7402 HLT /16 FAILED
1060 1542 1417 TAD I 17
1061 1543 7440 SZA
1062 1544 7402 HLT /17 FAILED
1063 1545 1417 TAD I 17
1064 1546 7440 SZA
1065 1547 7402 HLT /17 FAILED
1066 1548 6201 CDF 00 /SET DF TO FIELD 0
1067 1549 6202 CIF 00 /SET I.B. TO FIELD 0
1068 1550 6202 JMP GOTO0 /EXIT TO FIELD 0
1069 1551 6202 /END OF TEST ROUTINE
1070 1552 6202 /
1071 1553 6202 /
1072 1554 6202 /RING BELL AT THE COMPLETION OF TEST
1073 1555 6202 /CHECK SR1=1 FOR HLT AT END OF TEST
1074 1556 6202 /
1075 1557 6202 /
1076 1558 6202 /
1077 1559 6202 /
1078 1560 6202 /
1079 1561 6202 /
1080 1562 6202 /
1081 1563 6202 /
1082 1564 6202 /
1083 1565 6202 /
1084 1566 6202 /
1085 1567 6202 /
1086 1568 6202 /
1087 1569 6202 /
1088 1570 6202 /
1089 1571 6202 /
1090 1572 6202 /
1091 1573 6202 /
1092 1574 6202 /
1093 1575 6202 /
1094 1576 6202 /
1095 1577 6202 /
1096 1578 6202 /
1097 1579 6202 /
1098 1580 6202 /
1099 1581 6202 /
1100 1582 6202 /

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1101 /THE FAILING IF OR DF IS IN THE IF OR DF REG, AND THE CORRECT FIELD
1102 /NUMBER IS IN AC BITS 6 THRU 8,
1103 /
1104 /
1105 /
1106 1600 *1600
1107 /
1108 /
1109 1600 7004 RMFTSI, LAS /CHECK HOW MANY EXTENDED FIELDS
1110 1601 0044 AND K7 /ARE PRESENT
1111 1602 7041 CIA /NEGATE AND SAVE,
1112 1603 3205 DCA IFCN
1113 1604 4700 JMS I XFERP /TRANSFER RMFDY ROUTINE TO ALL
1114 1605 0000 IFCN, 0 /EXTENDED FIELDS,
1115 1606 7744 -34
1116 1607 1702 RMFDY-1
1117 1610 3275 DCA LBTSTC /SET RMFTST COUNTER FOR 4096 PASSES
1118 1611 1002 TAD JMP14 /SET INTERRUPT LINK,
1119 1612 3001 DCA 1
1120 1613 1274 TAD INTP
1121 1614 3004 DCA 4
1122 1615 6201 RMFL3, CDF 00 /INITIALIZE IF TO 0,
1123 1616 3041 DCA KIFSHB
1124 1617 1205 TAD IFCN /INITIALIZE TEST COUNTER
1125 1620 3275 DCA RMFCN1
1126 1621 1041 RMFL2, TAD KIFSHB /UPDATE CURRENT IF,
1127 1622 1045 TAD K10
1128 1623 3041 DCA KIFSHB
1129 1624 1041 TAD KIFSHB
1130 1625 7041 CIA
1131 1626 3042 DCA MIFSHB
1132 1627 1041 TAD K7770 /INITIALIZE DF COUNTER TO -10,
1133 1630 3077 DCA DFCN
1134 1631 1041 TAD K7770 /INITIALIZE DF TO -10,
1135 1632 3037 DCA KDFSHB
1136 1633 1037 RMFL1, TAD KDFSHB /UPDATE DF,
1137 1634 1045 TAD K10
1138 1635 3037 DCA KDFSHB
1139 1636 1037 TAD KDFSHB
1140 1637 7041 CIA
1141 1640 3040 DCA MDFSHB
1142 1641 1205 TAD IFCN /TRANSFER DF AND IF INFORMATION
1143 1642 3244 DCA ,+2 /TO EXTENDED FIELDS,
1144 1643 4700 JMS I XFERP
1145 1644 0000 0
1146 1645 7774 -4
1147 1646 1736 KDFSHB-1
1148 1647 6201 CDF 00
1149
1150
1151 1650 1040 TAD KCDF /UPDATE CDF INST,
1152 1651 1037 TAD KDFSHB
1153 1652 3200 DCA RMFI1
1154 1653 1041 TAD KCIF /UPDAT CIF INST,
1155 1654 1041 TAD KIFSHB

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1156	1655	3261	DCA	RMFI2	
1157	1656	6041	RMFE2,	TSP	/ENSURE TIO FLAG SET,
1158	1657	4622		JMS I	XTFLG
1159	1660	6201	RMFI1,	ODF	/SET OF AND IF TO CURRENT FIELD,
1160	1661	6202	RMFI2,	CIF	
1161	1662	5303		JMP	RMFDY
1162	1663	6244	INTE,	RMF	/GO TO RMFDY IN CURRENT IF,
1163	1664	5310		JMP	RMFDY1
1164	1665	2277	RMFE1,	ISZ	/ENTER FROM INTERRUPT FROM EX. FLD,
1165	1666	5233		JMP	RMFL1
1166	1667	2276		ISZ	RMFCN1
1167	1670	5221		JMP	RMFL2
1168	1671	2275		ISZ	LBTSTC
1169	1672	5215		JMP	RMFL3
1170	1673	5701		JMP I	XMEM
1171	1674	1663	INTEP,	INTE	/YES, GO TO NEXT TEST
1172	1675	0000	LBTSTC,	0	
1173	1676	0000	RMFCN1,	0	
1174	1677	0000	DFCN,	0	
1175	1700	2000	XFERP,	XFER	
1176	1701	2200	XMEM,	NOMEM	
1177	1702	5404	JMPI4,	JMP I 4	
1178			/		
1179			/		
1180			/		
1181			/		
1182			/		
1183					
1184					
1185					
1186			/ROUTINE TO CHECK CORRECT TRANSFERS FOR SAVE FIELD TO DATA FIELD AND		
1187			/SAVE FIELD TO INST. BUFFER TO INSTRUCTION FIELD AFTER		
1188			/RMF,		
1189			/STORED IN ALL EXTENDED FIELDS,		
1190	1703	6001	RMFDY,	ION	/THIS IS NOT TRANSFERRED,
1191	1704	7000		NOP	
1192	1705	6002		IOF	
1193	1706	7002		HLT	/INTERRUPT FAILURE,
1194	1707	5333		JMP	REPEAT
1195	1710	7200	RMFDY1,	CLA	
1196	1711	6214		ODF	/CHECK FOR CORRECT DATA FIELD
1197	1712	1000		TAD	MODFSHB
1198	1713	7050		SNA	CLA
1199	1714	5320		JMP	,+4
1200	1715	1037		TAD	KODFSHB
1201	1716	7002		HLT	/DATA FIELD INCORRECT
1202	1717	5333		JMP	REPEAT
1203	1720	6224		RIF	/SF TO DF TRANSFER FAILED AFTER RMF,
1204	1721	1042		TAD	MIFSHB
1205	1722	7050		SNA	CLA
1206	1723	5327		JMP	,+4
1207	1724	1041		TAD	KIFSHB
1208	1725	7002		HLT	/INSTRUCTION FIELD INCORRECT,
1209	1726	5333		JMP	REPEAT
1210	1727	6201	ODF	00	/SF TO IF TRANSFER FAILED AFTER RMF
					/REPEAT THIS TEST,
					/GO BACK AND RUN NEXT TEST,

1211	1730	6202	CIF	00	
1212	1731	5732	JMP I	,+1	
1213	1732	1665	RMFE1		
1214	1733	6201	REPEAT, CDF	00	/GO BACK AND REPEAT FAILING
1215	1734	6202	CIF	00	/TEST,
1216	1735	5736	JMP I	,+1	
1217	1736	1656	RMFE2		
1218	1737	0000	KDFSHB, 0		/DATA FIELD SHOULD BE
1219	1740	0000	MDFSHB, 0		/TWO'S COMPLEMENT OF ABOVE,
1220	1741	0000	KIFSHB, 0		/INSTRUCTION FIELD SHOULD BE
1221	1742	0000	MIFSHB, 0		/TWO'S COMPLEMENT OF ABOVE
1222			/		
1223			/		
1224			/		
1225			/		
1226			/		
1227			/		
1228			/ROUTINE TO TRANSFER N1 WORDS STARTING AT P IN FIELD 0 TO P IN THE		
1229			/NEXT N2 EXTENDED FIELDS,		
1230			/THE CALLING SEQUENCE IS:		
1231			/JMS I XFERP		
1232			/-N2		
1233			/-N1		
1234			/P-1		
1235					
1236					
1237					
1238			/		
1239	2000		*2000		
1240			/		
1241	2002	0000	XFER, 0		
1242	2001	0000	CLA		
1243	2002	0000	TAD I XFER	/GET -N2	
1244	2003	0000	DCA N2		
1245	2004	0000	ISZ XFER	/GET -N1	
1246	2005	0000	TAD I XFER		
1247	2006	0000	DCA N1		
1248	2007	0000	ISZ XFER	/GET P-1	
1249	2010	0000	TAD I XFER		
1250	2011	0000	DCA P		
1251	2012	0000	ISZ XFER	/UPDATE TO RETURN ADDRESS,	
1252	2013	0000	TAD KCDF	/INITIALIZE CDF INST,	
1253	2014	0000	DCA XFERIN		
1254	2015	0000	TAD N2		
1255	2016	0000	DCA XFERC2		
1256	2017	0000	XFERL2, TAD P	/PUT POINTER IN AUTO 10 AND 11,	
1257	2020	0000	DCA 10		
1258	2021	0000	TAD P		
1259	2022	0000	DCA 11		
1260	2023	0000	TAD N1	/SET COUNTER 1 TO -N1	
1261	2024	0000	DCA XFERC1		
1262	2025	0000	TAD XFERIN	/UPDATE CDF INST,	
1263	2026	0000	TAD K10		
1264	2027	0000	DCA XFERIN		
1265	2030	0000	XFERL1, CDF 00	/TRANSFER	

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1266 2031 1410 TAD I 10
1267 2032 6201 XFERIN, CDF
1268 2033 3411 DCA I 11
1269 2034 2246 ISZ XFERC1 /DONE WITH CURRENT FIELD?
1270 2035 5234 JMP XFERL1 /NO, CONTINUE.
1271 2036 2246 ISZ XFERC2 /DONE WITH ALL FIELDS?
1272 2037 5217 JMP XFERL2 /NO, DO NEXT FIELD
1273 2040 6201 CDF 00 /ALL DONE, SET DF=0,
1274 2041 5000 JMP I XFER /EXIT;
1275 2042 0000 N2, 0
1276 2043 0000 N1, 0
1277 2044 0000 P, 0
1278 2045 0000 XFERC2, 0
1279 2046 0000 XFERC1, 0
1280 /
1281 /TEST 06
1282 /NOW DO A READ AND WRITE DATA TEST IN
1283 /ALL AVAILABLE EXTENDED FIELDS,
1284 /IF A FAILURE OCCURS CHECK LOC, 10
1285 /FOR BAD ADDRESS AREA AND LOC, RANA
1286 /FOR THE MOST RECENT FIELD CHANGE,
1287 /LOC, KDATA CONTAINS DATA PATTERN USED,
1288 /
1289 2047 0000 DATER, 0000
1290 2050 7000 CLA CLL
1291 2051 4423 JMS I XSTKS
1292 2052 1040 TAD KCDF
1293 2053 1046 TAD K10
1294 2054 3257 DCA RANA /MODIFIED UNDER TEST
1295 2055 7000 CLA CLL CMA
1296 2056 3010 DCA 10 /SET AUTO REGISTER
1297 2057 0001 RANA, CDF
1298 2060 0276 JMS FILL /LOAD UP FIELD WITH DATA
1299 2061 7000 CLA CMA CLL
1300 2062 3010 DCA 10
1301 2063 4012 JMS CHECK /CHECK DATA IN FIELD
1302 2064 7000 CLA CLL
1303 2065 2031 ISZ STKS
1304 2066 7410 SKP
1305 2067 5274 JMP ,+5
1306 2070 1257 TAD RANA
1307 2071 1046 TAD K10
1308 2072 3257 DCA RANA /CHECK NEXT FIELD
1309 2073 0255 JMP RANA +2
1310 2074 6201 CDF
1311 2075 5047 JMP I DATER
1312 /
1313 /ROUTINE TO FILL FIELD WITH DATA
1314 /
1315 2076 0000 FILL, 0000
1316 2077 7000 CLA CLL
1317 2100 1157 TAD KDATA
1318 2101 3410 DCA I 10
1319 2102 1157 TAD KDATA
1320 2103 7040 CMA

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1321	2104	3410	DCA I 10	
1322	2105	1010	TAD 10	
1323	2106	7001	IAC	
1324	2107	7640	SZA CLA	
1325	2110	5277	JMP FILL +1	
1326	2111	5676	JMP I FILL	
1327				
1328			/ROUTINE TO CHECK DATA IN FIELD	
1329			/	
1330	2112	0000	CHECK, 0000	
1331	2113	7300	CLA CLL	
1332	2114	1410	TAD I 10	
1333	2115	7001	IAC	
1334	2116	1410	TAD I 10	
1335	2117	7440	SZA	/AC CONTAINS BAD BITS
1336	2120	7402	HLT	/MEMORY CONTROL WORKED BUT
1337	2121	7300	CLA CLL	/DATA PATTERN FAILURE IN
1338	2122	1010	TAD 10	/EXTENDED MEMORY.
1339	2123	7001	IAC	
1340	2124	7640	SZA CLA	/IS CHECK DONE
1341	2125	5313	JMP CHECK +1	
1342	2126	5712	JMP I CHECK	
1343			/	
1344			/	
1345				
1346				
1347				
1348				
1349				
1350	2200		*2200	
1351			/	
1352			/TEST 14	
1353			/REFERENCE ALL 4K FIELDS NOT PRESENT.	
1354			/IF 32K IS PRESENT, THE TEST IS BY-PASSED.	
1355			/EACH FIELD NOT PRESENT IS REFERENCED	
1356			/BY THE PROGRAM WITH JMP, DCA AND TAD.	
1357			/THE PROGRAM MUST CONTINUE IN SEQUENCE	
1358			/BELL WILL SIGNAL A SUCCESSFUL TEST	
1359			/	
1360	2200	7200	NOMEM, CLA	
1361	2201	1110	TAD K7770	
1362	2202	3007	DCA LOOP	/TEST LOOP COUNTER
1363	2203	7004	LAS	/READ SR9-11
1364	2204	0044	AND K7	
1365	2205	7041	CIA	
1366	2206	1044	TAD K7	/SUBTRACT MAX, POSSIBLE
1367	2207	7450	SNA	
1368	2210	5546	JMP I XXSR0	/32K PRESENT, CAN'T TEST
1369	2211	3033	DCA NOSTAK	/SAVE NO, MISSING
1370	2212	3547	DCA I XELL	/CLEAR THE TLS IOT AT
1371				/BELL+1 TO PROHIBIT
1372				/FALSE INDICATION, TLS
1373				/IS RESTORED LATER WRONG
1374				/ENTRY FROM NON-EXISTENT
1375				/MEMORY MAY CAUSE A


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1376                                     /HANG-UP AT BELL+2 AND +3,
1377 2213 7604 LAS                                     /# OF FIELDS PRESENT
1378 2214 0044 AND K7
1379 2215 7001 IAC                                     /+1 TO GET 1ST MISSING
1380 2216 7100 CLL
1381 2217 7006 RTL                                     /POSITION TO AC 6-8,
1382 2220 7004 RAL
1383 2221 3034 DCA NOFLD                               /1ST MISSING
1384 2222 1033 TAD NOSTAK                             /# STACKS NOT HERE
1385 2223 7041 CIA
1386 2224 3033 DCA NOSTAK                             /USED AS COUNTER
1387
1388
1389 /
1390 /
1391 2225 1040 TAD KCDF                               /6201
1392 2226 1034 TAD NOFLD                             /MISSING STACK
1393 2227 3245 DCA CDF0S
1394
1395 /NOW READ ALL 0'S FROM ALL NON-EXISTENT FIELDS
1396 /IF CONTROL PORTION ONLY, RING BELL,
1397 /IF NOT PROCEED TO TIME SHARE.
1398 /
1399 2230 4244 JMS ALL0                               /READ ALL 0 FROM 1ST
1400 2231 2033 CNSTK, ISZ NOSTAK                       /DONE ALL MISSING IF SKIP
1401 2232 5237 JMP POS
1402 2233 2027 ISZ LOOP                               /DONE LOOPING IF SKIP
1403 2234 5636 JMP I XNOM                             /REPEAT
1404 2235 5546 JMP I XXSR0
1405
1406 2236 2033 XNOM, NOMEM+3
1407 /
1408 2237 1240 POS, TAD CDF0S
1409 2240 1045 TAD K10                               /DE PLUS 1
1410 2241 3245 DCA CDF2S
1411 2242 4244 JMS ALL0                               /READ ALL 0'S
1412 2243 5231 JMP CNSTK                             /CHECK DONE
1413
1414
1415
1416 /
1417 /ROUTINE TO READ ALL 0'S.
1418 /
1419 2244 0000 ALL0, 0
1420 2245 6201 CDF0S, CDF 00                               /SET DF TO 1ST MISSING
1421 2246 7240 CLA CMA
1422 2247 3010 DCA 10                               /10 AND 11 USED FOR ADDRESS
1423 2250 7040 CMA
1424 2251 3011 DCA 11
1425 2252 3002 DCA 2                               /USE AS COUNTER
1426 2253 7040 CMA
1427 2254 3410 DCA I 10                             /WRITE 1'S INTO NON-EXIS-
1428                                     /TENT FIELD,
1429 2255 2002 ISZ 2
1430 2256 5253 JMP ,+3

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1431 2257 1411 TAD I 11 /READ NON-EXIST. FIELD
1432 2260 7650 SNA CLA /SHOULD = 0000
1433 2261 5264 JMP ,+3
1434 2262 1011 TAD 11
1435 2263 7402 CAX, HLT /ERROR, AN EXISTING FIELD
1436 / /WAS REFERENCED, C(AC)=
1437 / /ADDRESS REFERENCED
1438 2264 2002 ISZ 2
1439 2265 5257 JMP CAX-4 /READ NEXT
1440 /
1441 2266 6201 DONE0, CDF 00
1442 2267 6202 CIF 00
1443 2270 5644 JMP I ALL0 /EXIT
1444 /
1445 /
1446 /
1447 /TEST 04
1448
1449 /TEST GTF FOR FLAG AND SAVE FIELDS
1450 /GET SAVE FIELDS AFTER INTERRUPT
1451 /CHECK INTERRUPT INHIBIT, DO ALL
1452 /COMBINATIONS 0 TO 7,
1453 /
1454 2271 7320 GTF1, CLA CLL
1455 2272 1020 TAD JMP10 /SET FOR RETURN
1456 2273 3001 DCA 1
1457 2274 1040 TAD KCDF
1458 2275 3304 DCA XSDF
1459 2276 1304 MGTF, TAD XSDF /GET FIRST FIELD
1460 2277 7011 AND K0070
1461 2300 7120 STL
1462 2301 7012 RAR
1463 2302 7012 RTR
1464 2303 8112 DCA XSAV
1465 2304 4201 XSDF, CDF 00
1466 2305 5041 TSF /IS TTY FLAG SET
1467 2306 4022 JMS I XTFLG /GET THE FLAG
1468 2307 6001 ION
1469 2310 7040 CLA CLL CMA /CHECK FOR JAM ON GTF
1470 2311 6004 GTF /GET THE FLAGS
1471 2312 7041 CIA
1472 2313 1112 TAD XSAV /TTY * CURRENT FIELD
1473 2314 7040 SZA
1474 2315 7002 HLT /FLAG * FIELD
1475 2316 2027 ISZ LOOP /4096 TIMES
1476 2317 5276 JMP MGTF
1477 2320 1045 TAD K10
1478 2321 1304 TAD XSDF
1479 2322 3304 DCA XSDF
1480 2323 2113 ISZ XCOUNT /MORE FIELDS TO CHECK
1481 2324 5276 JMP MGTF
1482 2325 1110 TAD K7770
1483 2326 3113 DCA XCOUNT
1484 2327 5730 JMP I XION1 /YES, GO TO NEXT TEST
1485 2330 2031 XION1, ION1

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1480 /
1481 /TEST 05
1482 /TEST ION AND LINK FROM RTF
1483 /TEST INTERRUPT INHIBIT BEFORE PI
1484 /GET THE FLAGS WITH GTF,
1485 /
1486 ION1, CLA CLL
1487 TAD ISZ0
1488 DCA 1
1489 TAD JMP10
1490 DCA 2
1491 RTF
1492 JMP ,+1
1493 HLT /WAS INT, INH,
1494 2331 7300
1495 2332 1021
1496 2333 3001
1497 2334 1020
1498 2335 3002
1499 2336 6005
1500 2337 5340
1501 2340 7402
1502 2341 7300
1503 2342 1115
1504 2343 6005
1505 2344 7240
1506 2345 6004
1507 2346 7041
1508 2347 1115
1509 2350 7440
1510 2351 7402
1511 2352 7300
1512 2353 6005
1513 2354 7300
1514 2355 6004
1515 2356 7041
1516 2357 1115
1517 2360 7440
1518 2361 7402
1519 2362 3003
1520 2363 7402
1521 2364 7300
1522 2365 2027
1523 2366 5301
1524 2367 4005
1525 2370 4773
1526 2371 5772
1527 2372 2400
1528 2373 4000
1529 XRTF1, RTF1
1530 XCON1, CON1
1531 /
1532 /TEST 08
1533 /TEST DF00 + IF00 FROM SAVE FIELD AFTER PI
1534 /USE RTF TO SET THE FLAGS AND GTF TO GET THE FLAGS
1535 /CHECK INTERRUPT INHIBIT, DO ALL SAVE
1536 /FIELD COMBINATIONS 0 TO 77.
1537 /
1538 *2400
1539 /
1540 RTF1, CLA CLL
1541 JMS I XTFLG /SET ITY FLAG
1542 TAD ISZ0
1543 DCA 1
1544 TAD JMP10

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1541	2405	3402	DCA 2	
1542	2406	3114	DCA XTOR	
1543	2407	1114	TAD XTOR	
1544	2410	6005	RTF	/MAKE OF 00 + IF 00
1545	2411	5212	JMP ,+1	
1546	2412	7402	HLT	/WAS INT INH
1547	2413	7300	CLA CLL	
1548	2414	6004	GTF	/GET THE FLAGS
1549	2415	0117	AND K0077	
1550	2416	7041	CIA	
1551	2417	1114	TAD XTOR	/EXPECTED BITS
1552	2420	7440	SZA	
1553	2421	7402	HLT	/WAS OF + IF SET
1554	2422	2027	ISZ LOOP	/4096 TIMES
1555	2423	5207	JMP XSRTF	
1556	2424	1114	TAD XTOR	
1557	2425	1120	TAD K0011	
1558	2426	3114	DCA XTOR	
1559	2427	2113	ISZ XCOUNT	
1560	2430	5207	JMP XSRTF	/DO THE REST OF 00 + IF 00
1561	2431	1110	TAD K7770	
1562	2432	3113	DCA XCOUNT	
1563	2433	5034	JMP I XRIG1	
1564	2434	2452	XRIG1, RIG1	
1565	2435	0000	NSTKS, 0	
1566			/	
1567	2436	7604	LAS	/READ SR 9-11
1568	2437	0044	AND K7	
1569	2440	7041	CIA	
1570	2441	3031	DCA STKS	
1571	2442	0000	JMP I NSTKS	
1572			/	
1573			/SET ITY FLAG	
1574			/	
1575	2443	0000	TFLG, 0	
1576	2444	7200	CLA	
1577	2445	6040	SPF	
1578	2446	6041	TSF	
1579	2447	5246	JMP ,+1	
1580	2450	7200	CLA	
1581	2451	5043	JMP I TFLG	/EXIT
1582			/	
1583			/TEST 09	
1584			/TEST PROGRAM INTERRUPT IN EXISTING FIELDS	
1585			/USE RTF, GTF, RDF AND RIF FOR CHECK	
1586			/CHECK PC, AC, SF AND FLAGS AFTER PI	
1587			/IF FAILURE OCCURS CHECK XDATA FOR AC DATA,	
1588			/LOC. 0 FIELD 0 FOR CORRECT PC AFTER PI,	
1589			/AND IFDF FOR CORRECT OF XX + IF XX,	
1590			/PROGRAM SHOULD INTERRUPT INHIBIT TILL JMP I ADRS	
1591			/IF PI FAILS TO INTERRUPT HLT IN THAT FIELD	
1592			/	
1593	2452	7300	RIG1, CLA CLL	
1594	2453	4423	JMS I XSTKS	
1595	2454	1120	TAD K0011	

1596	2455	3260	DCA IFDF	
1597	2456	1132	TAD K0017	
1598	2457	3010	DCA 0010	
1599	2460	0000	IFDF, 0000	/SET IO CURRENT FIELD UNDER TEST
1600	2461	7300	CLA CLL	
1601	2462	1260	TAD IFDF	
1602	2463	6005	RTF	/SET FIELDS AND TURN ION
1603	2464	6022	IOF	
1604	2465	7300	CLA CLL	
1605	2466	2537	ISZ I K0000	
1606	2467	7000	NOP	
1607	2470	1537	TAD I K0000	
1608	2471	3136	DCA XDATA	
1609	2472	1124	TAD K7402	
1610	2473	3541	DCA I K0001	/STORE A HLT IN LOC 1 OF THAT FIELD
1611	2474	1133	TAD K0001	
1612	2475	3410	DCA I 0010	/ION FOR THAT FIELD
1613	2476	1130	TAD K1000	
1614	2477	3410	DCA I 0010	/TAD FOR THAT FIELD
1615	2500	1124	TAD K7402	
1616	2501	3410	DCA I 0010	/HLT FOR FAILURE
1617	2502	1010	TAD 10	
1618	2503	1057	TAD K7776	
1619	2504	3310	DCA ADRS	
1620	2505	1134	TAD JMPIR	
1621	2506	3001	DCA 0001	/SET LOC 1 FOR RETURN AFTER PI
1622	2507	5710	JMP I 1+1	/GO TO THAT FIELD
1623	2510	0000	ADRS, 0000	
1624	2511	7041	RET, CIA	
1625	2512	1136	TAD XDATA	
1626	2513	7040	SZA	
1627	2514	7042	HLT	/AQ DATA FAILED DURING PI
1628	2515	1010	TAD 0000	
1629	2516	7041	CIA	
1630	2517	1010	TAD 0010	
1631	2520	7440	SZA	
1632	2521	7402	HLT	/PC FAILED DURING PI
1633	2522	6214	RDF	
1634	2523	6224	RIF	
1635	2524	7040	SZA CLA	
1636	2525	7402	HLT	/SHOULD BE 0 AFTER PI
1637	2526	6004	GTF	
1638	2527	0117	AND K0077	
1639	2530	7041	CIA	
1640	2531	1260	TAD IFDF	
1641	2532	7440	SZA	
1642	2533	7402	HLT	/GTF OR RTF OR SF FAILED
1643	2534	1010	TAD 0010	
1644	2535	7001	IAC	
1645	2536	7040	SZA CLA	
1646	2537	5201	JMP IFDF+1	
1647	2540	2031	ISZ STKS	
1648	2541	7410	SKP	
1649	2542	5750	JMP I XTRMF	
1650	2543	7300	CLA CLL	

1651	2344	1120	TAD K0011	
1652	2545	1260	TAD IFDF	
1653	2546	3260	DCA IFDF	/SET FOR NEXT FIELD
1654	2547	5256	JMP IFDF =2	
1655	2550	1950	XTRMF, TRMF	
1656			/	
1657				
1658				
1659			/TEST 15	
1660			/TEST TIME SHARE IN FIELD 0.	
1661			/ALL HLT, OSR, AND IOT INSTRUCTIONS	
1662			/SHOULD TRAP IN USER MODE.	
1663			/	
1664	2600		*2600	
1665			/	
1666	2600	7300	T1, CLA CLL	
1667	2601	6027	CAF	
1668	2602	6264	CUF	
1669	2603	6204	CINT	
1670	2604	1021	TAD ISZ0	
1671	2605	3001	DCA 1	
1672	2606	1020	TAD JMP10	
1673	2607	3002	DCA 2	
1674	2610	6007	CAF	
1675	2611	7410	SKP	
1676	2612	5212	JMP ,	/CAF TRAPED
1677	2613	6001	ION	
1678	2614	7410	SKP	
1679	2615	5015	JMP ,	/ION TRAPED
1680	2616	6002	KCC	
1681	2617	7410	SKP	
1682	2618	6000	JMP ,	/KCC TRAPED
1683	2621	6002	IOF	
1684	2622	7410	SKP	
1685	2623	5003	JMP ,	/IOF TRAPED
1686	2624	6004	GTF	
1687	2625	7410	SKP	
1688	2626	5226	JMP ,	/GTF TRAPED
1689			/THESE INSTRUCTIONS SHOULD TRAP	
1690	2627	6001	T2, ION	
1691	2630	6274	CUF+10	/USER MODE
1692	2631	5232	JMP ,+1	
1693	2632	7402	HLT	
1694	2633	5233	JMP ,	/HLT DID NOT TRAP
1695			/EXECUTIVE MODE	
1696	2634	6254	SINT	/SKIP ON TRAP FLAG
1697	2635	5235	JMP ,	/FLAG NOT UP
1698	2636	6204	CINT	/CLEAR TRAP FLAG
1699	2637	6254	SINT	/SKIP ON TRAP FLAG
1700	2640	7410	SKP	
1701	2641	5241	JMP ,	/TRAP FLAG STILL SET
1702	2642	7604	LAS	/SHOULD NOT TRAP
1703	2643	7410	SKP	
1704	2644	5244	JMP ,	/LAS TRAPED IN EXECUTIVE MODE
1705	2645	6244	RMF	/RESTORE USER

1706	2646	6001	ION	
1707	2647	5250	JMP ,+1	/GO TO USER
1708			/USER MODE	
1709	2650	7404	OSR	/SHOULD TRAP ON OSR
1710	2651	5251	JMP ,	/DID NOT TRAP
1711			/EXECUTIVE MODE	
1712	2652	6254	SINT	/SKIP ON TRAP FLAG
1713	2653	5253	JMP ,	/DID NOT SKIP
1714	2654	6107	CAF	/CLEAR TRAP FLAG
1715	2655	6254	SINT	/TEST IF CLEARED
1716	2656	7410	SKP	
1717	2657	7402	HLT	/TRAP FLAG NOT CLEARED
1718	2660	7404	OSR	/SHOULD NOT TRAP
1719	2661	7410	SKP	
1720	2662	5252	JMP ,	/ORS TRAPED IN EXECUTIVE MODE
1721	2663	6244	RMF	/RESTORE MODE
1722	2664	6001	ION	
1723	2665	5265	JMP ,+1	/GO TO USER
1724				
1725			/USER MODE	
1726	2666	6005	RTF	/MAKE THE FLAGS
1727	2667	5267	JMP ,	/RTF FAILED TO TRAP
1728			/EXECUTIVE MODE	
1729	2670	6254	SINT	
1730	2671	5271	JMP ,	/TRAP FLAG NOT SET
1731	2672	6254	CINT	/CLEAR TRAP FLAG
1732	2673	6254	SINT	/TEST IF CLEARED
1733	2674	7410	SKP	
1734	2675	7402	HLT	/TRAP FLAG NOT CLEARED
1735	2676	6254	GTF	/SHOULD NOT TRAP
1736	2677	7410	SKP	
1737	2700	5250	JMP ,	/TRAPED IN EXECUTIVE MODE
1738	2701	6244	RMF	/RESTORE MODE
1739	2702	6001	ION	
1740	2703	5004	JMP ,+1	/GO TO USER
1741			/USER MODE	
1742				
1743	2704	6001	ION	
1744	2705	5305	JMP ,	/ION DID NOT TRAP
1745				
1746			/EXECUTIVE MODE	
1747	2706	6254	SINT	/SKIP ON TRAP FLAG
1748	2707	5307	JMP ,	/TRAP FLAG NOT SET
1749	2710	7000	CLA CLL	
1750	2711	6204	GTF	
1751	2712	0126	AND K0100	
1752	2713	7450	SNA	
1753	2714	7402	HLT	/SUF NOT SET
1754	2715	6244	CINT	/CLEAR TRAP FLAG
1755	2716	6254	SINT	/TEST IF CLEARED
1756	2717	7410	SKP	
1757	2720	7402	HLT	/FLAG NOT CLEARED
1758	2721	6002	IOF	/SHOULD NOT TRAP
1759	2722	7410	SKP	
1760	2723	5323	JMP ,	/IOF TRAPED IN EXECUTIVE MODE

1761	2724	6244	RMF	/RESTORE MODE
1762	2725	6001	ION	
1763	2726	5327	JMP ,+1	/GO TO USER
1764			/USER MODE	
1765			/TEST CUF AND CUF+10	
1766	2727	7604	LAS	
1767	2730	5330	JMP ,	/DID NOT TRAP
1768			/EXECUTIVE MODE	
1769	2731	6204	CINT	
1770	2732	6244	RMF	
1771	2733	6264	CUF	/STAY IN EXECUTIVE MODE
1772	2734	6001	ION	
1773	2735	5336	JMP ,+1	
1774	2736	7404	OSR	
1775	2737	7410	SKP	
1776	2740	5340	JMP ,	/CUF DID NOT WORK
1777			/TEST THAT INSTRUCTION ARE INHIBITED WHILE IN USER MODE	
1778	2741	6204	CINT	
1779	2742	6274	CUF+10	/SET USER
1780	2743	6001	ION	
1781	2744	5345	JMP ,+1	/GO TO USER
1782			/USER MODE	
1783	2745	7240	CMA CLA	/AC=7777
1784	2746	7604	LAS	/SHOULD CLEAR AC
1785	2747	5347	JMP ,	/DID LAS TRAP
1786			/EXECUTIVE MODE	
1787	2750	7440	SZA	
1788	2751	7402	HLT	/LAS CHANGED AC
1789	2752	6204	CINT	
1790	2753	6204	RMF	
1791	2754	6001	ION	
1792	2755	5406	JMP ,+1	
1793			/USER MODE	
1794	2756	7200	CLA	
1795	2757	7404	OSR	/SHOULD NOT READ SR
1796	2760	5360	JMP ,	
1797			/EXECUTIVE MODE	
1798	2761	7440	SZA	
1799	2762	7402	HLT	/OSR CHANGED AC
1800	2763	6204	CINT	
1801	2764	6244	RMF	
1802	2765	6001	ION	
1803	2766	5367	JMP ,+1	
1804				
1805			/USER MODE	
1806	2767	7240	CLA CMA	
1807	2770	7602	HLT CLA	/SHOULD CLA
1808	2771	5371	JMP ,	/DID HLT TRAP
1809			/EXECUTIVE MODE	
1810	2772	7440	SZA	
1811	2773	7402	HLT	/(HLT CLA) DID NOT CLEAR
1812	2774	6204	CINT	
1813	2775	6003	SRQ	
1814	2776	7410	SKP	
1815	2777	7402	HLT	/INTERRUPT REQUEST

1816	3000	7300	CLA CLL	
1817	3001	1126	TAD K0100	
1818	3002	6005	RTF	/ENABLE USER
1819				
1820	3003	6001	ION	
1821	3004	7000	NOP	
1822	3005	5206	JMP ,+1	
1823			/USER MODE	
1824	3006	6032	KCC	
1825	3007	5207	JMP ,	/DID KCC TRAP
1826			/EXECUTIVE MODE	
1827	3010	6003	SRQ	/IS USER FLAG SET
1828				
1829	3011	5210	JMP ,+1	
1830	3012	6204	CINT	
1831	3013	7300	CLA CLL	
1832	3014	1126	TAD K0100	
1833	3015	6005	RTF	
1834	3016	7300	CLA CLL	
1835	3017	6001	ION	
1836	3020	5221	JMP ,+1	/ENTER USER
1837			/USER MODE	
1838	3021	6204	GTF	
1839	3022	5222	JMP ,	/DID GTF TRAP
1840			/EXECUTIVE MODE	
1841	3023	6126	AND K0100	
1842	3024	7000	SEA	/DID GTF GET USER
1843	3025	7002	HLT	
1844	3026	6003	SRQ	/IS USER FLAG SET
1845	3027	5220	JMP ,+1	
1846	3030	6204	CINT	
1847	3031	6004	RMF	
1848	3032	6001	ION	
1849	3033	5234	JMP ,+1	
1850			/USER MODE	
1851	3034	6004	GTF	
1852	3035	5235	JMP ,	/GTF DID NOT TRAP
1853			/EXECUTIVE MODE	
1854	3036	6254	SINT	/SKIP ON TRAP FLAG
1855	3037	5237	JMP ,	/FLAG NOT UP
1856	3040	6204	CINT	/CLEAR TRAP FLAG
1857	3041	5234	SINT	/SKIP ON TRAP FLAG
1858	3042	7010	SKP	
1859	3043	5243	JMP ,	/TRAP FLAG STILL SET
1860	3044	6001	ION	
1861	3045	7010	SKP	
1862	3046	5246	JMP ,	/ION TRAPED IN EXECUTIVE MODE
1863	3047	6244	RMF	/RESTORE USER
1864	3050	5251	JMP ,+1	/GO TO USER
1865			/USER MODE	
1866	3051	6202	CIF	/SHOULD TRAP ON CIF
1867	3052	5252	JMP ,	/DID NOT TRAP
1868			/EXECUTIVE MODE	
1869	3053	6254	SINT	/SKIP ON TRAP FLAG
1870	3054	5254	JMP ,	/DID NOT SKIP

1871	3055	6204	CINT	/CLEAR TRAP FLAG
1872	3056	6254	SINT	/TEST IF CLEARED
1873	3057	7410	SKP	
1874	3060	7402	HLT	/TRAP FLAG NOT CLEARED
1875	3061	6202	CIF	/SHOULD NOT TRAP
1876	3062	7410	SKP	
1877	3063	5263	JMP ,	/CIF TRAPED IN EXECUTIVE MODE
1878	3064	6244	RMF	/RESTORE MODE
1879	3065	6001	ION	
1880	3066	5267	JMP ,+1	/GO TO USER
1881				
1882				
1883			/USER MODE	
1884	3067	6214	RDF	/READ DATA FIELD
1885	3070	5270	JMP ,	/DID R0F TRAP
1886			/EXECUTIVE MODE	
1887	3071	6254	SINT	
1888	3072	5272	JMP ,	/TRAP FLAG NOT SET
1889	3073	6204	CINT	/CLEAR TRAP FLAG
1890				
1891	3074	6254	SINT	/TEST IF CLEARED
1892	3075	7410	SKP	
1893	3076	7402	HLT	/TRAP FLAG NOT CLEARED
1894	3077	6214	RDF	/SHOULD NOT TRAP
1895	3100	7410	SKP	
1896	3101	5001	JMP ,	/TRAPED IN EXECUTIVE MODE
1897			/EXECUTIVE MODE	
1898	3102	6040	SPF	/FLAG SHOULD WORK
1899				
1900	3103	6041	TSF	
1901	3104	5003	JMP ,+1	/SHOULD SKP
1902	3105	5003	SRQ	
1903	3106	5005	JMP ,+1	/SHOULD SKP
1904	3107	6001	ION	
1905	3110	7000	CLA CLL	
1906	3111	5011	JMP ,	/DID PI WORK
1907	3112	1126	TAD K0100	
1908	3113	6005	RTF	
1909	3114	5007	CAF	
1910	3115	6001	ION	
1911	3116	5017	JMP ,+1	
1912			/USER MODE	
1913	3117	6007	CAF	
1914	3120	5020	JMP ,	/DID CAF TRAP
1915			/EXECUTIVE MODE	
1916	3121	6003	SRQ	
1917	3122	7402	HLT	/USER FLAG UP
1918	3123	6007	CAF	
1919	3124	6254	SINT	
1920	3125	7410	SKP	
1921	3126	7402	HLT	/FLAG CLEARED
1922			/TEST THAT TTI DOES NOT	CHANGE AC
1923	3127	7240	CLA CMA	/AC=7777
1924	3130	7120	STL	/LINK#1
1925	3131	6274	CUF+10	

1926	3132	6001	ION	
1927	3133	5334	JMP ,+1	
1928			/USER MODE	
1929	3134	6036	KRB	/SHOULD NOT ZERO LINK OR SHIFT AC
1930	3135	5335	JMP ,	
1931			/EXECUTIVE MODE	
1932	3136	7040	CMA	
1933	3137	7440	SZA	/AC SHOULD=0000
1934	3140	5340	JMP ,	/AC WAS CHANGED
1935	3141	7420	SNL	/LINK SHOULD EQUAL 1
1936	3142	5342	JMP ,	/LINK WAS CHANGE
1937	3143	6254	SINT	/SKIP ON TRAP FLAG
1938	3144	5344	JMP ,	/TRAP FLAG NOT SET
1939	3145	6224	CINT	
1940	3146	6244	RMF	
1941	3147	6001	ION	
1942	3150	5351	JMP ,+1	
1943			/USER MODE	
1944	3151	6040	SPF	/FLAG
1945	3152	5352	JMP ,	/DID SPF TRAP
1946			/EXECUTIVE MODE	
1947	3153	6041	TSF	
1948	3154	7410	SKP	
1949	3155	7402	HLT	/TIY FLAG
1950	3156	6254	SINT	
1951	3157	5357	JMP ,	/TRAP FLAG NOT SET
1952	3160	6204	CINT	/CLEAR TRAP FLAG
1953	3161	6244	RMF	
1954	3162	6001	ION	
1955	3163	5704	JMP I ,+1	/GO TO USER
1956	3164	3200	, 177+1	
1957				
1958		3200	*, 177+1	
1959				
1960			/USER MODE	
1961				
1962	3200	6001	ION	
1963	3201	5201	JMP ,	/ION DID NOT TRAP
1964			/EXECUTIVE MODE	
1965	3202	6254	SINT	/SKIP ON TRAP FLAG
1966	3203	5203	JMP ,	/TRAP FLAG NOT SET
1967	3204	6204	CINT	/CLEAR TRAP FLAG
1968	3205	6254	SINT	/TEST IF CLEARED
1969	3206	7410	SKP	
1970	3207	7402	HLT	/FLAG NOT CLEARED
1971	3210	6002	IOF	/SHOULD NOT TRAP
1972	3211	7410	SKP	
1973	3212	5212	JMP ,	/IOF TRAPED IN EXECUTIVE MODE
1974	3213	6244	RMF	/RESTORE MODE
1975	3214	6001	ION	
1976	3215	5216	JMP ,+1	/GO TO USER
1977			/USER MODE	
1978			/TEST CUF AND CUF+10	
1979	3216	6224	RIF	
1980	3217	5217	JMP ,	/DID NOT TRAP

1981		/EXECUTIVE MODE	
1982	3220 6204	CINT	
1983	3221 6244	RMF	
1984	3222 6264	CUF	/STAY IN EXECUTIVE MODE
1985	3223 5224	JMP ,+1	
1986	3224 7404	OSR	
1987	3225 7410	SKP	
1988	3226 5226	JMP ,	/CUF DID NOT WORK
1989		/EXECUTIVE MODE	
1990	3227 7240	CLA CMA	
1991	3230 6274	CUF +10	/SET UP USER
1992	3231 6001	ION	
1993	3232 5233	JMP ,+1	
1994		/USER MODE	
1995	3233 7402	HLT	/SHOULD TRAP
1996	3234 5234	JMP ,	/DID HLT TRAP
1997		/EXECUTIVE MODE	
1998	3235 6203	CDF CIF	
1999	3236 6264	CUF	/SETUP FOR EXECUTIVE
2000	3237 6204	CINT	/CLEAR INTERRUPT
2001	3240 6001	ION	
2002	3241 5242	JMP ,+1	
2003	3242 7004	LAS	/SHOULD NOT TRAP
2004	3243 7410	SKP	
2005	3244 5244	JMP ,	
2006	3245 7450	SNA	/SR AND AC SHOULD NOT EQUAL ZERO
2007	3246 5246	JMP ,	/LAS WAS INHIBITED
2008			
2009		/TEST HLT AND SKIP	
2010	3247 6274	CUF+10	/USER SETUP
2011	3250 6001	ION	
2012	3251 5202	JMP ,+1	/GO TO USER
2013		/USER MODE	
2014	3252 7412	SKP HLT	/SHOULD TRAP
2015	3253 5253	JMP ,	/DID NOT TRAP
2016	3254 5254	JMP ,	/SKP DID NOT INDEX PC,
2017		/EXECUTIVE MODE	
2018	3255 6254	SINT	/SKP ON TRAP FLAG
2019	3256 5256	JMP ,	
2020	3257 6204	CINT	/CLEAR FLAG
2021	3260 6254	SINT	/IS IT CLEAR
2022	3261 7410	SKP	/YES
2023	3262 5262	JMP ,	/NO-FLAG NO CLEAR
2024			
2025		/LOOP PROGRAM	
2026	3263 2266	ISZ ,+3	/DO FIRST SECTION 4096
2027	3264 5531	JMP I TIME	
2028	3265 7410	SKP	
2029	3266 0000	0	/COUNT FOR LOOP
2030	3267 5670	JMP I ,+1	
2031	3270 5400	, 177+1	
2032			
2033			
2034	3400	*, 177+1	
2035			

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2036 /TEST THAT ALL IOTS TRAP IN USER MODE
2037 3400 7200 CLA
2038 3401 1125 TAD K0000 /BASIC IOT
2039 3402 3207 DCA INST /SET UP
2040 3403 6274 IOTST, CUF+10 /SET FOR USER
2041 3404 6204 CINT /CLEAR FLAG
2042 3405 6001 ION
2043 3406 5207 JMP ,+1 /GO TO USER MODE
2044 /USER MODE
2045 3407 6000 INST, 6000 /IOT THAT FAILED
2046 3410 5210 JMP /IOT DID NOT TRAP
2047 /EXECUTIVE MODE
2048 3411 6254 SINT /SKIP ON TRAP FLAG
2049 3412 5212 JMP /TRAP FLAG NOT SET
2050 3413 6204 CINT /CLEAR FLAG
2051 3414 6254 SINT
2052 3415 7610 SKP CLA
2053 3416 7402 HLT /FLAG DID NOT CLEAR
2054 3417 2207 ISZ INST /CREATE NEW INSTRUCTION
2055 3420 1207 TAD INST /TESTED ALL IOT?
2056 3421 1130 AND K1000
2057 3422 7650 SNA CLA
2058 3423 5203 JMP IOTST /NO -- TEST THE REST
2059
2060 /TEST THAT ALL (HLT AND OSR) TRAP IN USER MODE
2061 3424 1124 TAD K7402 /BASIC HALT INST
2062 3425 3232 DCA INSTA /SET UP
2063 3426 6274 HALTA, CUF+10 /SET FOR USER
2064 3427 6204 CINT /CLEAR FLAG
2065 3430 6001 ION
2066 3431 5232 JMP ,+1 /GO TO USER MODE
2067 /USER MODE
2068 3432 7406 INSTA, HLT OSR /OPERATE TRAP INST
2069 3433 5233 JMP /DID NOT TRAP
2070 /EXECUTIVE MODE
2071 3434 7000 NOP /FOR (HLT,SKP)(OSR,SKP)
2072 3435 6254 SINT /SKIP ON TRAP FLAG
2073 3436 5236 JMP /TRAP FLAG NOT SET
2074 3437 6204 CINT /CLEAR FLAG
2075 3440 6254 SINT
2076 3441 7610 SKP CLA
2077 3442 7402 HLT /FLAG DID NOT CLEAR
2078 3443 1232 TAD INSTA
2079 3444 1123 TAD K0004 /GENERATE ALL GROUPS OF
2080 3445 3232 DCA INSTA /HALTS AND OSR
2081 3446 1232 TAD INSTA
2082 3447 1122 TAD K0002
2083 3450 7640 SZA CLA /GENERATED ALL
2084 3451 5226 JMP HALTA /NO -- TEST THE REST
2085 3452 6244 RMF
2086 3453 6254 CUF
2087 3454 6001 ION
2088 3455 5256 JMP ,+1
2089 3456 6002 IOF /SHOULD NOT TRAP
2090 3457 6254 SINT

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2091	3460	7410	SKP	
2092	3461	7402	HLT	/TRAP FLAG SET
2093	3462	6040	SPF	
2094	3463	6041	TSP	/SHOULD SKP
2095	3464	5263	JMP	-1
2096	3465	6001	ION	
2097	3466	7410	SKP	
2098	3467	7402	HLT	/DID PI INTERRUPT
2099	3470	7402	HLT	/DID PC INCR,
2100				
2101	3471	7300	CLA	CLL
2102	3472	6004	GTF	
2103	3473	0126	AND	K0100
2104	3474	7440	SZA	
2105	3475	7402	HLT	/SUF SET
2106	3476	7300	CLA	CLL
2107	3477	6007	CAF	
2108	3500	6264	CUF	
2109	3501	7200	NOP	
2110			/	
2111			/TEST 16	
2112			/TEST TIME SHARE IN EXTENDED MEMORY	
2113			/NOW TEST USER MODE TRAP IN ALL EXTENDED FIELDS	
2114			/IF TRAP ERROR OCCURS HLT IN THAT FIELD	
2115			/USE RTF TO SET USER MODE AND GTF TO GET THE FLAGS	
2116			/TEST ALL IOTIS FOR TRAP AND RETURN	
2117			/	
2118	3502	7300	RIG2, CLA	CLL
2119	3503	6007	CAF	
2120	3504	4003	JMS	I XSTKS /CHECK NO. OF FIELDS PRESENT
2121	3505	1000	TAD	KCOP
2122	3506	1000	TAD	K10
2123	3507	0005	DCA	SRD /SET OF FOR FIRST FIELD
2124	3510	1001	TAD	KCIF
2125	3511	1005	TAD	K10
2126	3512	0047	DCA	SRI /SET IF FOR FIRST FIELD
2127	3513	1114	STAN, TAD	K5577 /GET START OF PROGRAM -1
2128	3514	3010	DCA	10
2129	3515	1145	TAD	K7745 /NO. OF INSTRUCTIONS TO TRANSFER
2130	3516	3143	DCA	SRCO
2131	3517	7040	CMA	
2132	3520	0111	DCA	11 /START AT 0000
2133				
2134	3521	1035	TAD	SRD /MAKE FLAGS FOR RETURN CHECK
2135	3522	1111	AND	K0070
2136	3523	7110	RAR	
2137	3524	7012	RTR	
2138	3525	3112	DCA	XSAV
2139	3526	1047	TAD	SRI
2140	3527	0111	AND	K0070
2141	3530	1112	TAD	XSAV
2142	3531	1142	TAD	K1100
2143	3532	3776	DCA	I XPDCON
2144	3533	6201	ODF	00
2145	3534	1110	TAD	I 10

2146	3535	6201	SRO,	CDF 00	
2147	3536	3411		DCA I 11	/STORE INSTRUCTIONS
2148	3537	2143		ISZ SRC0	
2149	3540	5333		JMP SRO-2	
2150	3541	1021		TAD ISZ0	
2151	3542	3001		DCA 1	/SET FIELD 0 FOR RETURN
2152	3543	1347		TAD SRI	
2153	3544	3002		DCA 2	
2154	3545	1020		TAD JMP10	
2155	3546	3003		DCA 3	
2156	3547	6272	SRI,	CIF 00	
2157	3550	5002		JMP 2	/GO TO FIELD UNDER TEST
2158	3551	7302	SRRET,	CLA CLL	
2159	3552	2031		ISZ STKS	
2160	3553	7410		SKP	/MORE FIELDS
2161	3554	5364		JMP EXITT	/GO TO CONTROL
2162	3555	1335		TAD SRD	/SET UP FOR NEXT FIELD
2163	3556	1045		TAD K10	
2164	3557	3335		DCA SRD	
2165	3560	1347		TAD SRI	
2166	3561	1045		TAD K10	
2167	3562	3347		DCA SRI	
2168	3563	5313		JMP STAN	/TEST THIS FIELD
2169	3564	7300	EXITT,	CLA CLL	/TEST DONE GO TO BEGIN
2170	3565	6047		CAF	
2171	3566	6264		CUF	
2172	3567	1131		TAD TTB	
2173	3570	3347		DCA I XELL	
2174	3571	7404		LAS	
2175	3572	7700		SMA CLA	
2176	3573	5500		JMP I XBELL	
2177	3574	7102		HLT	/TIME SHARE ENABLED
2178					/AN ERROR CONDITION EXISTS,
2179	3575	5502		JMP I XTRAP	/HIT CONTINUE TRY AGAIN
2180	3576	3642	XFDCON, FDCON		
2181			/		
2182			/INSTRUCTIONS TO BE TRANSFERED TO FIELDS		
2183			/		
2184		3600	*3600		
2185			/		
2186	3604	7402		HLT	/SHOULD NOT HLT HERE
2187	3601	7402		HLT	/SHOULD NOT TRAP HERE
2188	3602	7400	FDCO,	CLA CLL	
2189	3603	1232		TAD FDCON	/GET USER BIT
2190	3604	6045		RTF	/SET FOR USER
2191	3605	5206		JMP ,+1	/GO TO USER
2192			/USER MODE		
2193	3606	6000	IOTX,	IOT	
2194	3607	5207		JMP ,	/DID IOT TRAP
2195			/EXECUTIVE MODE		
2196	3610	7300		CLA CLL	
2197	3611	6004		GTF	/GET THE FLAGS
2198	3612	7041		CIA	
2199	3613	1232		TAD FDCON	/FLAGS THAT SHOULD BE PRESENT
2200	3614	7640		SZA CLA	

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2201 3615 7402 HLT /CHECK THE FLAGS
2202 3616 6203 SRQ
2203 3617 5216 JMP ,+1 /IS TRAP FLAG SET
2204 3620 6204 CINT
2205 3621 2206 ISZ IOTX
2206 3622 1206 TAD IOTX
2207 3623 1231 TAD F1000
2208 3624 7640 SZA CLA
2209 3625 5202 JMP F0G0
2210 3626 6202 CIF
2211 3627 5030 JMP I FRET /TEST DONE GO TO FIELD 0
2212 3630 3551 FRET, SRRET
2213 3631 1000 F1000, 1000
2214 3632 0000 FDCON, 0000
2215 /
2216 /CHECK SR0=1 FOR MEMORY EXTENSION ONLY
2217 /
2218 3633 7300 XSR0, CLA CLL
2219 3634 7604 LAS
2220 3635 7700 SMA CLA
2221 3636 5531 JMP I TIME
2222 3637 6907 CAF
2223 3640 1151 TAD TTB
2224 3641 3547 DCA I XBELL
2225 3642 5030 JMP I XBELL
2226 /
2227 3643 7300 TRAP, CLA CLL
2228 3644 1153 TAD ATRAP
2229 3645 5301 DCA 1 /SET FOR RETURN
2230 3646 6074 SUF /SET FOR USER
2231 3647 6101 ION
2232 3648 5031 JMP ,+1 /GO TO USER
2233 3651 7402 HLT /TIME SHARE DISABLED, HIT
2234 3652 6203 SINT /CONTINUE TO LOOP ON CONTROL,
2235 3653 7410 SKP
2236 3654 7402 HLT /ERROR, TRAP INT, ROST, UP
2237 3655 6204 CUF
2238 3656 6007 CAF
2239 3657 5527 JMP I PLACE /GO TO BEGIN
2240 /
2241 /TEST 07
2242 /CONFIDENCE CHECK ON ALL EXISTENT FIELDS,
2243 /MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK,
2244 /MAKE SURE JUMP IS TO CORRECT STACK,
2245 /CHECK ALL COMBINATIONS,
2246 /FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC.0
2247 /
2248 4000 *4000
2249 /
2250 4000 0000 CON1, 0000 /FIRST FILL CORE, ALL STACKS
2251 4001 7300 CLA CLL /DCA I FOR 32K
2252 4002 3623 DCA FUNUM
2253 4003 3624 DCA NUMX
2254 4004 1040 TAD KCDF
2255 4005 3232 DCA CONX

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2256	4006	1110	TAD K7770	
2257	4007	3527	DCA MSTKS	/SET FOR MAX, 32K
2258	4010	1110	TAD K7770	
2259	4011	3531	DCA STKS	
2260	4012	1040	TAD KCDF	
2261	4013	3214	DCA ,+1	
2262	4014	6201	FDWRD, CDF	/MODIFIED UNDER TEST
2263	4015	4307	JMS FILCOR	
2264	4016	2031	ISZ STKS	/ARE ALL STACKS DONE
2265	4017	5222	JMP ,+3	
2266	4020	4252	JMS CONCHK	/CHECK RESULTS
2267	4021	5227	JMP CON2	
2268	4022	1045	TAD K10	
2269	4023	1214	TAD FDWRD	
2270	4024	3214	DCA FDWRD	/UPDATE FIELD CHANGE
2271	4025	3324	ISZ NUMX	
2272	4026	5214	JMP FDWRD	
2273			/	
2274	4027	7330	CON2, CLA CLL	/DO ONE AT A TIME
2275	4030	1323	TAD FDNUM	
2276	4031	3324	DCA NUMX	
2277	4032	6201	CONX, CDF	
2278	4033	4307	JMS FILCOR	
2279	4034	6203	CDF CIF	
2280	4035	4252	JMS CONCHK	
2281	4036	7500	CLA CLL	
2282	4037	1232	TAD CONX	
2283	4040	1045	TAD K10	
2284	4041	3232	DCA CONX	/UPDATE FIELD CHANGE
2285	4042	2030	ISZ FDNUM	
2286	4043	2027	ISZ MSTKS	/ARE ALL STACKS DONE
2287	4044	5227	JMP CON2	
2288	4045	6203	CDF CIF	
2289	4046	6007	CAF	
2290	4047	2027	ISZ LOOP	/DO 4096 TIMES
2291	4050	5201	JMP CON1 +1	
2292	4051	5200	JMP I CON1	/TEST COMPLETE
2293			/	
2294	4052	5000	CONCHK, 0000	/CHECK ALL AVAILABLE STACKS
2295	4053	7300	CLA CLL	
2296	4054	3324	DCA NUMX	
2297	4055	7504	LAS	
2298	4056	0544	AND K7	
2299	4057	7040	CMA	
2300	4060	3031	DCA STKS	/STACKS PRESENT
2301	4061	1041	TAD KCIF	
2302	4062	3263	DCA ,+1	/START WITH FIELD 0
2303	4063	6202	CONCH, CIF	/MODIFIED UNDER TEST
2304	4064	5541	JMP I K0001	
2305	4065	7041	RETADD, CIA	/RETURN HERE FROM FIELDS
2306	4066	1324	TAD NUMX	
2307	4067	7550	SNA	
2308	4070	5276	JMP ,+6	/GOOD FIELD
2309	4071	3112	DCA XSAV	
2310	4072	1263	TAD CONCH	

2311	4073	0111	AND K0070	
2312	4074	1112	TAD XSAV	/INCORRECT STACK REFERENCED,
2313	4075	7402	HLT	/AQ BITS 6-8 GOOD FIELD,
2314	4076	7300	CLA CLL	/AQ BITS 9-11 BAD FIELD,
2315	4077	2031	ISZ STKS	
2316	4100	7410	SKP	/CHECK ALL AVAILABLE STACKS,
2317	4101	5552	JMP I CONCHK	
2318	4102	1263	TAD CONCH	
2319	4103	1045	TAD K10	
2320	4104	3263	DCA CONCH	/UPDATE FIELD CHANGE
2321	4105	2324	ISZ NUMX	
2322	4106	5263	JMP CONCH	
2323				
2324	4107	0002	FILCOR, 0002	/INSTRUCTIONS FOR FIELDS
2325	4110	1324	TAD NUMX	/MODIFIED TO DF#
2326	4111	3537	DCA I K0000	
2327	4112	1130	TAD K1000	
2328	4113	3541	DCA I K0001	
2329	4114	1041	TAD KCIF	
2330	4115	3522	DCA I K0002	
2331	4116	1326	TAD JMPRET	
2332	4117	3540	DCA I K0003	
2333	4120	1525	TAD XRETAD	
2334	4121	3523	DCA I K0004	
2335	4122	5737	JMP I FILCOR	
2336				
2337	4123	0000	FDNUM, 0000	
2338	4124	0000	NUMX, 0000	
2339	4125	4045	XRETAU, RETADD	
2340	4126	5004	JMPRET, JMP I 4	
2341	4127	0000	MSTKS, 0000	
2342			S	

4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 00000000 00000000 00000000 00000000 00000000

4200

4300

4400

4500

4600

4700

5000

5100

5200

5300

5400

5500

5600

5700

6000

6100

6200

6300

6400

6500

6600

6700

7000

7100

7200

7300

7400

7500

7600

7700

ADRS	2510	DONE0	2266	K0004	0123	KNTR	0102
AGAIN1	0711	ENTER	1200	K0011	0120	KRB	6036
AGAIN2	1005	EXFD	1016	K0017	0132	KRTN	0106
ALLO	2244	EXFLD	1302	K0070	0111	KXFLD	0100
ATRAP	0153	EXITT	3564	K0077	0117	LBTP	1515
BEGIN	0203	F1000	3631	K0100	0126	LBTSTC	1675
BEGIN1	0200	FCO	0154	K1	0043	LOOP	0027
BELL	1555	FDCON	3632	K10	0045	MUFSHB	1740
CAA	0053	FDGO	3602	K1000	0130	MGTF	2276
CAB	0754	FDNUM	4123	K1100	0142	MIFSHB	1742
CAC	0755	FDWRD	4014	K1200	0116	MOVE	1463
CAD	0741	FILCOR	4107	K20	0103	MSTKS	4127
CAE	1036	FILDY	1516	K3577	0144	N1	2043
CAF	6007	FILL	2076	K5200	0115	N2	2042
CAG	1020	FRET	3630	K6000	0125	NDF	0030
CAI	1133	GOTO0	1510	K6001	0133	NEWDF	1440
CAX	2263	GTF	6004	K7	0044	NOFLD	0034
CAF	6201	GTF1	2271	K7000	0047	NOMEM	2200
CDF0S	2245	HALTA	3426	K7402	0124	NOSTAK	0033
CHDF	1074	HLTS	0671	K7700	0121	NSTKS	2435
CHECK	2112	IB0	0345	K7707	0050	NUMX	4124
CIF	6202	IB1	0354	K7717	0056	OK1	0231
CIFCK	0753	IB2	0402	K7727	0055	OK2	0257
CIFCK1	1046	IB3	0421	K7737	0054	OK3	0305
CIFJMP	0723	IB4	0444	K7744	0071	OK4	0333
CIFJMS	1017	IB5	0463	K7745	0145	OK5	0373
CIFJPL	0715	IB6	0506	K7747	0053	OK6	0440
CIFJSL	1011	IB7	0525	K7757	0052	OK7	0502
CINI	6204	IBSF	0656	K7766	0067	OK8	0544
CK00	1000	IBSF1	1000	K7767	0051	P	2044
CNSTK	0001	IFCN	1605	K7770	0110	PLACE	0127
CON1	4000	IFDF	2460	K7771	0064	POINT	0065
CON2	4007	INST	3407	K7772	0063	POS	2237
CONCH	4063	INSTA	3432	K7773	0062	RANA	2057
CONCHK	4002	INTE	1663	K7774	0061	RUF	6214
CONX	4002	INTER	1674	K7775	0060	REPEAT	1733
CUF	6264	IOF	6002	K7776	0057	RET	2511
DAT	0032	ION	6001	K7777	0046	RETADD	4065
DATER	2047	ION1	2031	K7S	0066	RIB	6234
DCAI	0001	IOT	6000	KCAI	0036	RIF	6224
DF0	0211	IOTST	3403	KCAIM	0035	RIG1	2452
DF1	0230	IOTX	3606	KCC	6032	RIG2	3502
DF2	0246	ISX0	0021	KCOF	0040	RMF	6244
DF3	0263	JMP2	0104	KCOF1	0156	RMFCN1	1676
DF4	0274	JMPI0	0020	KCIF	0041	RMFDY	1703
DF5	0011	JMPI4	1702	KDATER	0157	RMFDY1	1710
DF6	0322	JMPIR	0134	KDFSHB	1737	RMFE1	1665
DF7	0220	JMPRET	4126	KFLD0	0105	RMFE2	1056
DFCN	1077	K0000	0137	KHLT	0037	RMFI1	1660
DFLD	0007	K0001	0141	KIFSHB	1741	RMFI2	1661
DFN	1046	K0002	0122	KJMP	0101	RMFL1	1633
DCAUTO	1517	K0003	0140	KNOP	0752	RMFL2	1621

RMFL3	1615	XNOM	2236
RMFTST	1600	XRANS	0025
RTF	6005	XRET	0135
RTF1	2400	XRETAD	4125
RTRN	1427	XRIG1	2434
SF10	1400	XRMF	0024
SINT	6254	XRTF1	2372
SKON	6000	XSAV	0112
SPF	6240	XSDF	2304
SR00	0143	XSR0	3633
SR0	3535	XSRTF	2407
SR1	3547	XSTKS	0023
SRQ	6003	XTDF	0076
SRRET	3551	XTDF1	0077
STAN	3513	XTFLG	0022
STDF	1127	XTOR	0114
STKS	0031	XTRAP	0152
STRMF	1107	XTRMF	2550
SUF	6274	XXSR0	0146
T1	2600		
T2	2627		
TADI	0622		
TAUTO	1032		
TFLD	0630		
TFLC	2343		
TIME	1131		
TRANS	1621		
TRAP	3643		
TRELD	1637		
TRMF	1107		
TDF	0011		
YTH	1151		
XAUTO	0125		
XCELL	0112		
XCON1	2473		
XCOUNT	0113		
XDATA	0106		
XDATAH	0155		
XELL	0147		
XFO	0042		
XFOCON	3576		
XFER	2000		
XFERC1	2046		
XFERC2	2045		
XFERIN	2032		
XFERL1	2030		
XFERL2	2017		
XFERP	1700		
XFIB	0107		
XGTF1	1047		
XION1	2530		
XMEM	1701		

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 20 SECONDS

3K CORE USED

[illegible]

[illegible]

[illegible]

KCDF	57#	443	461	511	636	658	680	759	1151	1252	1292	1391	1487	2121
KCDF1	2254	2260												
KCIF	137#													
KDATER	58#	530	580	683	1008	1154	2124	2301	2329					
KDFSHB	138#	1317	1319											
KFLD0	1135	1136	1139	1139	1147	1152	1200	1218#						
KHLT	95	96#												
KIFSHB	56#	156	515	517	519	664	773	911						
KJMP	1123	1126	1128	1129	1155	1207	1220#							
KNOP	92#	850	917											
KNTR	502	567#												
KRB	93#	852												
KRTN	30#	1929												
KXFLO	97#	919												
LBTP	91#	854												
LBSTG	1023	1024#												
LOOP	1117	1168	1172#											
	48#	178	182	206	209	231	235	258	271	299	306	343	347	385
	389	427	439	474	529	563	579	612	663	665	676	749	909	937
	957	1021	1362	1402	1475	1520	1554	2290						
MDFSHB	1141	1197	1219#											
MGT	1459#	1476	1481											
MIFSHB	1131	1204	1221#											
MOVE	986#	991												
MSTKS	2257	2286	2341#											
N1	1247	1260	1276#											
N2	1244	1254	1275#											
NOF	49#	442	447	455	460	469	480							
NEWDF	961#	1020	1022											
NOFLO	53#	1386	1392											
NOHEM	1176	1360#	1400											
NOSTAK	179	1319	1386	1386	1400									
NSTKS	41	1565#	1571											
NUMX	2253	2271	2270	2296	2306	2321	2325	2338#						
OK1	173	178#												
OK2	192	200#												
OK3	226	231#												
OK4	252	256#												
OK5	296	299#												
OK6	339	343#												
OK7	381	385#												
OK8	422	427#												
P	1250	1256	1258	1277#										
PLACE	114#	1088	1090	2239										
POINT	78#	677												
POS	1401	1405#												
PANA	1294	1297#	1300	1308	1309									
RDF	11#	161	170	186	196	213	225	239	249	286	312	329	352	371
	394	412	704	1007	1196	1633	1884	1894						
REPEAT	1194	1202	1209	1214#										
RET	120	1624#												
RETADD	2305#	2339												
RIS	14#	277	295	319	336	361	378	402	419	548	556	597	605	712

		120														
	RIF	12#	1203	1634	1979											
	RIG1	1564	1593#													
	RIG2	2118#														
	RMF	13#	711	71Y	934	1162	1705	1721	1738	1761	1770	1790	1801	1847	1863	
		1878	1940	1953	1974	1983	2085									
	RMFCN1	1125	1166	1173#												
	RMFDY	1116	1161	1190#												
	RMFOY1	1163	1195#													
	RMFE1	1164#	1213													
	RMFE2	1157#	1217													
	RMFI1	1153	1159#													
	RMFI2	1156	1160#													
	RMFL1	1136#	1165													
	RMFL2	1126#	1167													
	RMFL3	1122#	1169													
	RMFTSI	1024	1109#													
	RTF	20#	1497	1502	1510	1544	1602	1720	1818	1833	1908	2190				
	RTF1	1525	1536#													
	RTSN	96	937#													
	SFIB	98	906#	927												
	SINT	17#	1696	1699	1712	1715	1729	1732	1747	1755	1854	1857	1869	1872	1887	
		1891	1919	1937	1950	1965	1968	2018	2021	2048	2051	2072	2075	2090	2234	
	SKON	24#	260													
	SFF	26#	1577	1898	1944	2093										
	SRUO	126#	2130	2148												
	SED	2123	2134	2140#	2149	2162	2164									
	SRI	2126	2139	2152	2156#	2165	2167									
	SRO	25#	1813	1827	1844	1902	1916	2202								
	SREK	2158#	2212													
	STAN	2127#	2168													
	STDF	89	90	682	685	686	690#	697								
	STKS	100	449	472	521	561	610	649	666	747	1019	1303	1570	1647	2159	
		2050	2264	2300	2315											
	STRMF	673#	752													
	SUF	15#	2230													
	T1	116	1660#													
	T2	1690#														
	TAD1	451	458#													
	TAUTO	47	939	955#												
	TFLD	464#	478	479	481	486										
	TFLG	43	1575#	1581												
	TIME	119#	134	2027	2221											
	TRANS	46	789	842#	892											
	TRAP	133	2227#													
	TRFLD	863#	867	874	880	886										
	TRMF	45	635#	650	1655											
	TSF	27#	272	527	577	673	906	1083	1157	1466	1578	1900	1947	2094		
	TTB	132#	2172	2223												
	XAUTO	47#														
	XBELL	131#	2176	2223												
	XCON1	1523	1526#													
	XCOUNT	102#	1480	1483	1559	1562										

[illegible]